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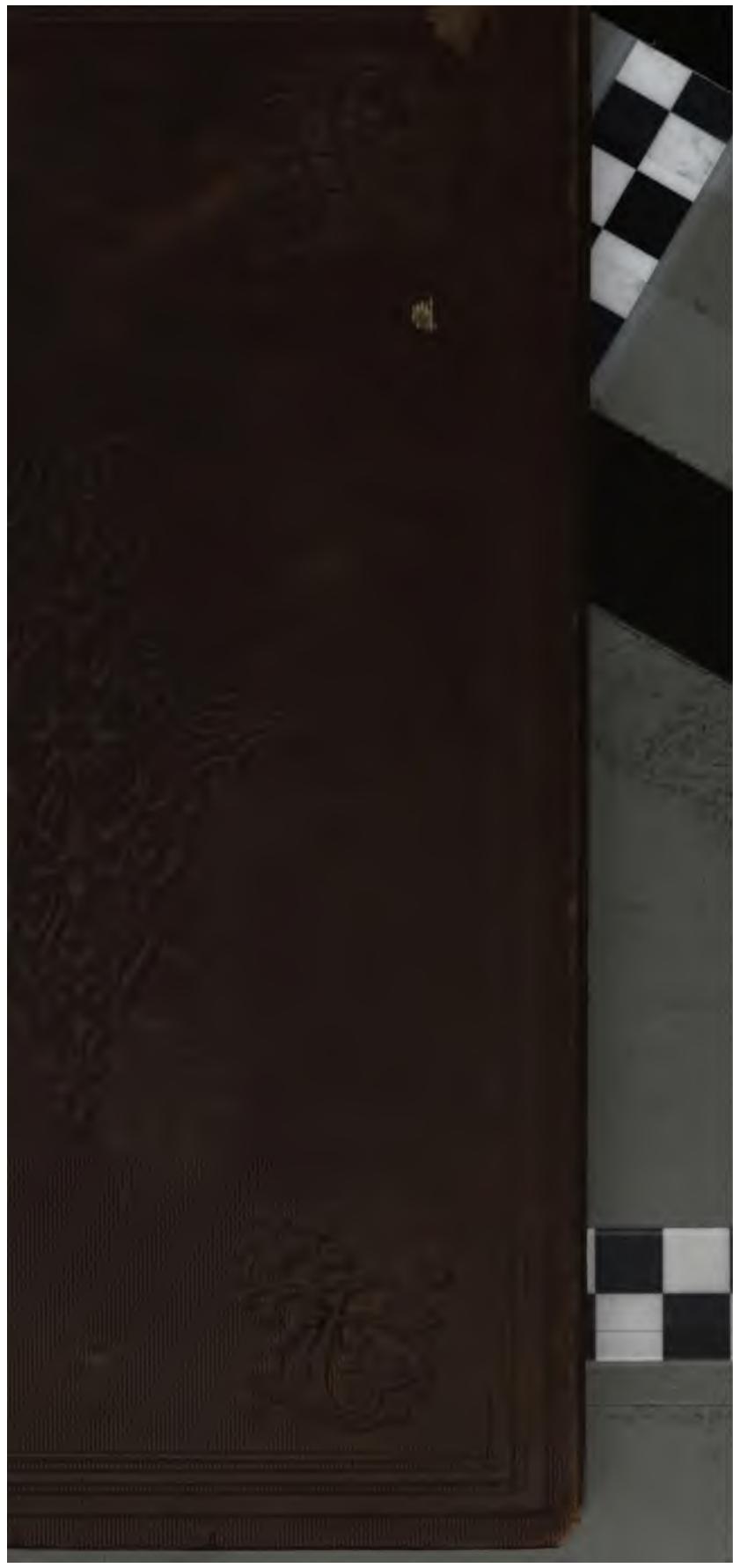
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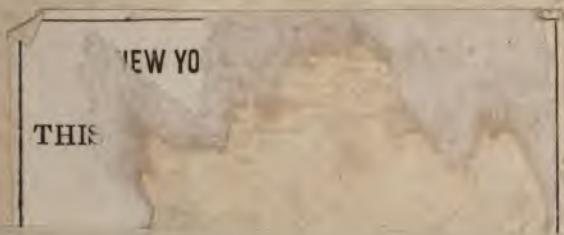
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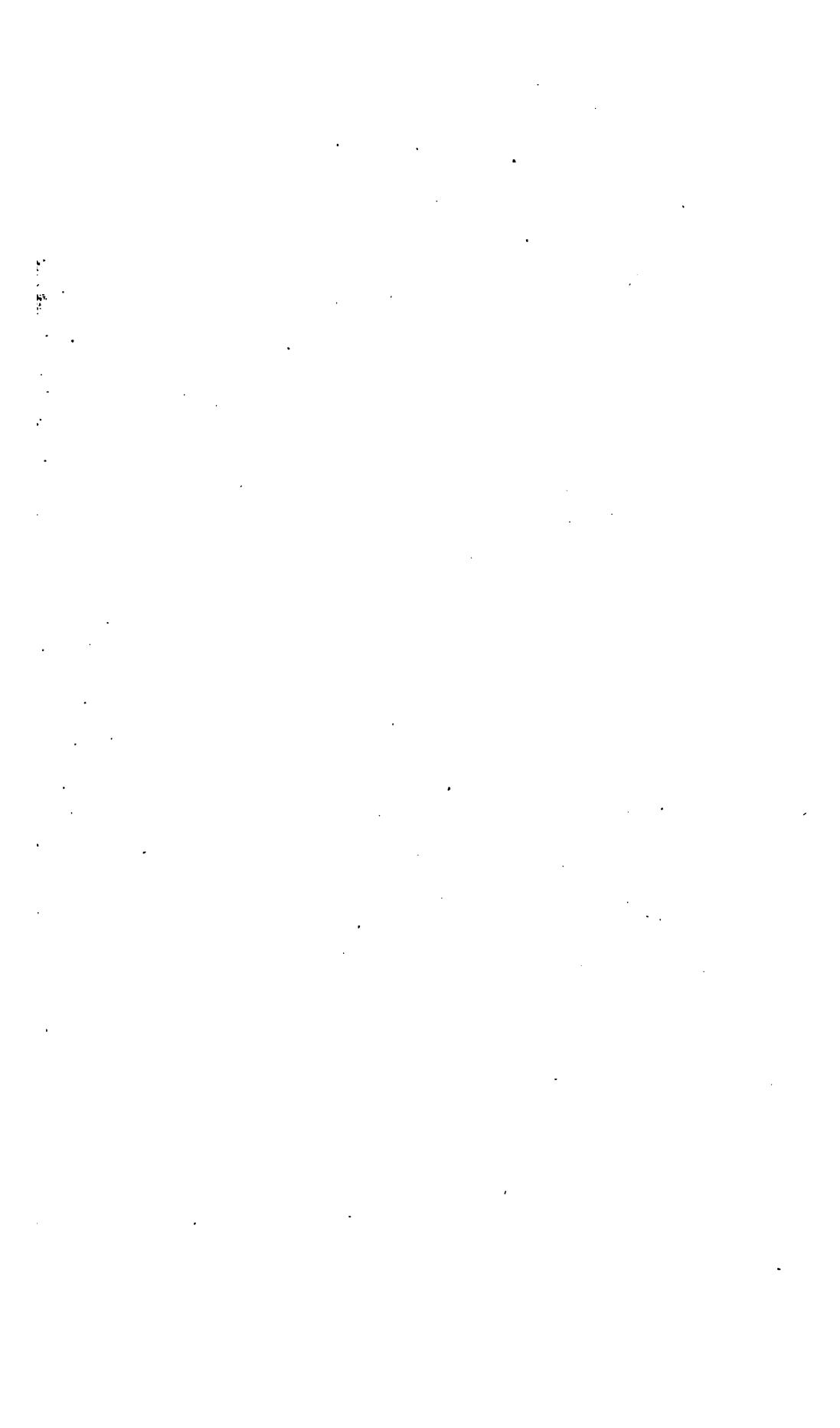


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THE
PATHOLOGY AND TREATMENT
OF
LEUCORRHEA.

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BY

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P R E F A C E.

AN outline of the principal points treated of in the following pages, was contained in a Memoir presented to the Royal Medical and Chirurgical Society, in April, 1852, and printed in the thirty-fifth volume of the "Medico-Chirurgical Transactions." Since the publication of that paper, I have given much further attention to the subject of Uterine and Vaginal discharges, and the results may, I trust, be found useful in determining some of the hitherto vexed questions relating to the Pathology and Treatment of Leucorrhœa and its allied disorders.

UPPER GROSVENOR STREET,

January, 1855.



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PATHOLOGY AND TREATMENT

OF

LEUCORRHOEA.

CHAPTER I.

THE MINUTE ANATOMY OF THE VAGINA AND THE OS AND CERVIX UTERI.

FEW topics have been more discussed during recent years, than those relating to the pathology and treatment of disorders of the uterine organs attended by discharges. But it must be confessed, that discussion has expended itself chiefly upon verbal criticism, and contributed very little towards the more clear comprehension of this department of medicine. There has been much of argument, but, as I submit, little of rigorous examination. Tongue and pen have been plied with remarkable assiduity, yet the difficulties surrounding the subject have been rather increased than diminished. On many points of diagnosis and pathology, apparently the most simple and easy of solution, the greatest uncertainty still prevails. This uncertainty naturally extends itself to the subject of treatment, and shows itself at every turn in practice. The various lesions, real and supposed, of the os and cervix uteri,—ulceration, induration, and inflammation,—have been attacked or defended by their partisans and opponents with the hottest zeal. In the diagnosis of these affections, some have practised instrumental examinations to an extent hitherto unprecedented in this country, while others have condemned such examinations alto-

gether. As regards treatment, we see that at one time injections, at another pessaries, at another cauterizations, are assailed with the utmost vigor, leaving the conscientious practitioner bewildered and uncertain as to what are really the best methods of controlling the confessedly troublesome and prevalent maladies, for which these and other appliances are in turn vaunted or anathematized.

Under these circumstances, it appeared to me that a microscopical examination of the discharges in leucorrhœa might throw some light upon the pathology of this malady. An accurate knowledge of this disorder seemed also more likely than any formal arguments to confine the use of the speculum and local treatment within proper limits. The external or physical qualities of these discharges had been described again and again,—though little agreement is found amongst those authors who have given their attention to this subject,—but I could find no minute and trustworthy account of the discharges or the sources from whence they are derived. I proceeded, therefore, in the latter part of 1851, to obtain a microscopical examination of the leucorrhœal secretions in every suitable case which came under my care at St. Mary's Hospital. I shall have hereafter to describe the microscopical characters of these discharges; but I may here state I had not prosecuted the subject long before I saw that the discrepancies and difficulties which surrounded it could only be cleared up by a microscopical examination of the parts involved in the production of leucorrhœa. I next examined carefully the mucous surface of the os and cervix uteri,—the region of the greatest consequence in Leucorrhœa,—and the results of that examination I shall endeavor to set forth in the following pages. But in this place I ought to mention, and I do so with the warmest thanks, that in the microscopical part of the investigation I am under great obligations to my friends, Dr. A. H. Hassall and Dr. Handfield Jones. Dr. Hassall made with me, at my request, an examination of the entire mucous membrane of the os and cervix uteri. To Dr. Handfield Jones I owe a large number of examinations of the leucorrhœal secretions made at the commencement of the present inquiry. I have also received much assistance, in the way of procuring healthy and morbid uteri, from Dr. J. W. Ogle, curator of the museum of St. George's Hospital, and from two of the resident medical officers of St. Mary's Hospital, Messrs.

Trotter and Bullock. The woodcuts which illustrate the present volume are from drawings made by Mr. Miller, a very talented microscopic artist. The drawings themselves were executed under the careful superintendence of Dr. Hassall, and in all which are above the size of nature, the camera lucida was employed to insure fidelity.

It may be objected, that in the present inquiry I have adhered too strictly to the term Leucorrhœa, and I venture at the outset to say a few words respecting this objection. It is very true that leucorrhœal discharge is a symptom of different and sometimes opposite conditions of the uterus and vagina. But it is the most common and prominent symptom in the majority of uterine cases, and in its principal form, that of discharge from the glands of the canal of the cervix uteri, it is not merely the expression of a symptom, but of the disease itself. If we consider leucorrhœa generally, as a distinct disorder, and treat it as such, the result is certainly mischievous. But if we partially or entirely ignore the discharges, and, referring to them as little as possible, use the words inflammation, ulceration, induration, hypertrophy, and other allied terms, we make no real advance, but merely shift from one set of prominent symptoms to another. Moreover, in a considerable number of cases of leucorrhœa, a state the very opposite to that of inflammation exists. If we attempted to define the most prominent disorders of the utero-vaginal canal, in which leucorrhœa is a symptom, we should have to deal with a very profuse nomenclature. We might treat of epithelial vaginitis, of villous or papillary vaginitis, of eruptive disorders of the os and cervix, of cervicitis, of endocervicitis, and more common than any of these, of follicular disorder of the cervical canal, which cannot properly be termed inflammatory, and many other such subdivisions. Without doubt, the affections to which such names might be given are occasionally found in definite and uncomplicated forms, but they frequently run into each other so irregularly as to defy classification. Moreover, they would not include numerous conditions attended by leucorrhœal discharge, such as the syphilitic and strumous constitutions, uterine tumors, cancer uteri, and uterine displacements. Altogether, it appears to me that in the present state of our knowledge the term leucorrhœa groups together a large number of disordered conditions more conveniently than any

other now in use. It is by taking leucorrhœa as the starting-point, and investigating the different kinds of discharge, and the various states upon which these discharges depend, that we may best hope, in my opinion, to gain an exact knowledge of an important class of uterine affections. As regards practical results, I scarcely need to insist upon the facilities for treatment which must necessarily arise from a comprehension of the various lesions in which leucorrhœa occurs, and the different sources and constitution of the discharge. With these views, it is my present purpose to give, in the first instance, a description of the minute anatomy of the Vagina and the Os and Cervix Uteri, and the secretions of these parts in their normal states; afterwards to proceed to the microscopical Pathology of the same mucous surfaces, and their morbid secretions in leucorrhœal disorders; and then to consider the Treatment of this class of affections. I may here mention that the examination of the discharges in leucorrhœa gradually led me to the microscopical examination of the discharges in the diseases of menstruation, and I found that these two classes of disease throw much mutual light upon each other. Upon some future opportunity it is my intention to treat of the minute anatomy of the Fundus Uteri, and the pathology and treatment of the principal disorders of menstruation, including amenorrhœa, dysmenorrhœa, menorrhagia, vicarious menstruation, and the catamenial climacteric. It will be found that all these disorders have important relations with the different forms of leucorrhœa.

The Vagina.—It will be unnecessary in this place to refer to the anatomical characters of the vagina, except in so far as this organ is concerned in the phenomena of leucorrhœa. The vaginal canal is formed of an external contractile sheath, a middle erectile layer, and an internal mucous or cutaneous lining. The contractile and erectile layers are most largely developed at the lower part of the vagina. The mucous membrane is studded with large papillæ, or villi, which are very numerous in the lower part of the canal, but diminish in number on passing upwards towards the os uteri. At the entrance of the vagina these papillæ are large and club-shaped, and they are frequently double, or even treble, at their extremities, two or three of them appearing to grow from a single stalk. The whole of the vaginal mucous membrane is covered by a layer of pavement epithelium, which is thicker in the upper part of the

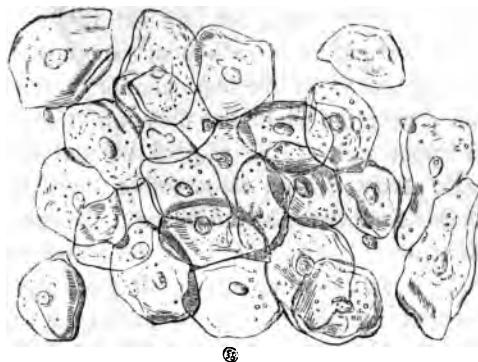
vagina than at the orifice. The coating of epithelium, and the subepithelial papillæ, are the parts of the vagina most largely concerned in vaginal leucorrhœa. At the vulva there is a large supply of sebaceous follicles, and just within the entrance of the vagina, particularly in the vicinity of the meatus urinarius, there are numerous mucous glands, the orifices of which are frequently large enough to be seen by the naked eye. Two of these glands, situated at the ostium vaginae, just within the carunculae myrtiformes, were well known to the older anatomists, and attention has been drawn to them in recent years by M. Huguier, an eminent anatomist and surgeon, who has paid special attention to the structure of the utero-vaginal canal. They are of considerable size, and have been called the vulvo-vaginal glands, it being thought that they were analogous to the glands of Cowper in the male. Occasionally these glands are so much enlarged or distended with fluid from the obstruction of their ducts, or by suppuration, as to diminish the outlet of the vagina. Numerous mucous follicles are also found at the entrance of the urethra. Mucous follicles and glands are generally described in anatomical works, on the authority of Huschke, and others, as becoming more numerous on ascending the vagina, and as being particularly abundant as the mucous membrane approaches the cervix uteri. This appeared on the most minute examination I could make, to be an error; the glandular element being in reality very scanty in the upper part of the vaginal mucous membrane. M. Paul Dubois also states that an able anatomist and teacher, M. Giralde, was unable to discover any follicles in the upper part of the vagina. Thus it would seem, looking at the glandular elements of the canal, that it is not from the upper, but from the lower portion of the vagina, that mucous discharges might be expected. The whole of the vagina is, however, as regards leucorrhœa, of considerably less importance than the mucous membrane of the os and cervix uteri.

The Os Uteri, and the External, or Vaginal portion of the Os and Cervix Uteri.—Like the mucous membrane in other parts of the body, the mucous covering of the os and cervix uteri consists of 1, epithelium; 2, primary, or basement membrane; and 3, fibrous tissue, bloodvessels, and nerves. There are, however, numerous points of special character belonging to the mucous membrane in this situation; and for convenience of description the mucous mem-

brane of the os and cervix uteri may be divided into two tracts, one comprising the surface of the os uteri and external portion of the cervix, the other being the mucous lining of the canal or cavity of the cervix. In the first place I proceed to describe the mucous membrane of the os uteri and external portion of the cervix, or that which lies between the junction of the cervix with the vagina, and the margin at which the mucous membrane of the os uteri becomes continuous with the mucous lining of the canal of the cervix.

The layer of epithelium found in this situation is tessellated or squamous, and is so arranged as to form a membrane of considerable thickness. On the free surface it is comparatively smooth, but its attached surface is rough and excavated from the projection of the villi or papillæ into the epithelial layer. After maceration in water for a few days, or when incipient decomposition has taken place, it can readily be detached from the papillæ, and raised from the surface of the mucous membrane. It closely resembles the epithelial covering of the vagina, with which it is continuous.

FIG. 1.



Pavement epithelium covering the os uteri. 240 diameters.

Immediately beneath the layer of epithelium, the basement membrane is found, covering numerous villi or papillæ, which stud the whole surface of the mucous membrane. These villi are sufficiently large, in some specimens, to be seen by the naked eye, when a thin section is held up to the light. The villi of the os uteri are generally single, but occasionally two or three villi are united together upon a single pedicle. When the villi are partially or entirely de-

nuded of their epithelial and sub-epithelial coverings by maceration, or decomposition after death, or in certain diseased conditions, an uneven appearance is given to the os uteri. The extremities of the villi, from which the covering of scaly epithelium has been removed by maceration, present a very characteristic appearance when seen by a low power. They form an irregular fringe standing out from the surface upon which they are placed. This appearance is very well shown in the following woodcut, from a drawing, after a preparation by Dr. Hassall.

FIG. 2.

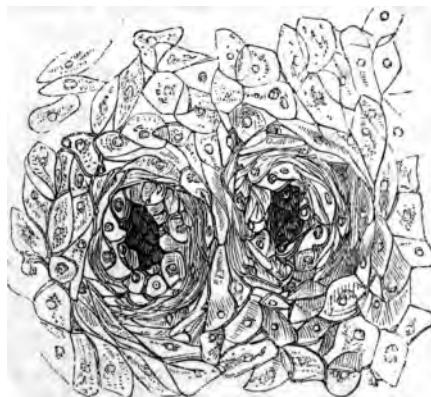


Papillæ or villi of the os and cervix uteri. 24 diameters.

Much information as to the nature of these villi may be gained by examining them with different powers of the microscope. When a thin portion is sliced from the surface of the os uteri, and examined with a higher power than that used in the preceding examination, the points of the villi appear nipple-shaped, and the whole surface is studded with wavy eminences formed by the villi. Around the bases of the projections, and immediately upon them, the epithelial scales are more numerous and crowded than in the interspaces. The shape of the scales in the crowded parts becomes narrower and more acutely pointed. In the centre of the point of each villus a

depression is seen, suggesting the probability that the extremities of the villi may be more specially engaged than the other parts in the production of the mucus of the os uteri and the vaginal portion of the cervix. This arrangement of the villi and their epithelial envelope considerably increases the extent of the epithelial surface.

FIG. 3.

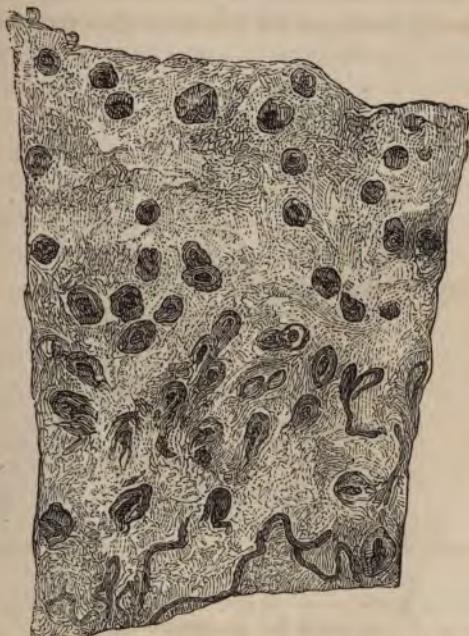


Extremities of villi of the os uteri, showing their central depressions.
220 diameters.

The surface of the os uteri is generally described by authors as containing numerous mucous follicles. A variety of diseases are referred to morbid changes in these follicles, and they have been made to play an important part in the pathology of leucorrhœa by many authors; but under the microscope, it is difficult to make out any distinct follicular structure. On looking with a low power at a section taken from the os uteri, an appearance very similar to that presented by mucous follicles is observed; but on a closer examination it is found that the dark spots, which appear like mucous crypts, are really elevations with central depressions. Some of the dark spots will be seen to contain red points, which are terminations of the bloodvessels of the villi. In other parts of the same specimen the bloodvessels can often be seen with great distinctness. The appearances which might be mistaken for mucous follicles seem, in fact, to be nothing else than the villi, more or less obscured by their epithelial covering. In examining different parts of the same specimen, we may detect that what appears at first to be de-

pressions are evidently slight elevations; and that the points which seemed to be the site of follicles are really the terminations of villi.

FIG. 4.



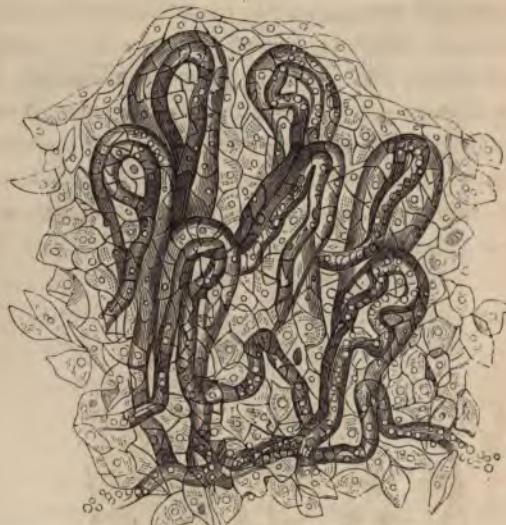
Villi of the os uteri seen through the epithelial layer. Above, the villi resemble mucous follicles; below, they are seen with the terminations of the vascular loop, the epithelium being partly removed. 60 diameters.

If the figures 3 and 4 are examined, it will be seen that the mamillary eminences formed by the villi may very readily be mistaken for mucous crypts. Another source of error has arisen from the occasional presence of Nabothean ovules, as they are termed, in the situation of the villi. The villi have been mistaken for mucous crypts, and the ovula Nabori have been supposed to be the same crypts obstructed and distended with mucus.

When a few of the villi are examined by a high power, in a recent specimen, each villus is found to contain a looped bloodvessel, which may be seen passing to the end of the villus, and returning to its base, where it inosculates with the bloodvessels of the neighboring villi. These villi are everywhere covered by a thick layer of pave-

ment epithelium, which also fills up the intervals between them, rendering the external surface comparatively smooth, as seen by the naked eye. In the subjoined woodcut, the outlines of several villi,

FIG. 5.



Villi of the os uteri covered by pavement epithelium, and containing looped bloodvessels. 220 diameters.

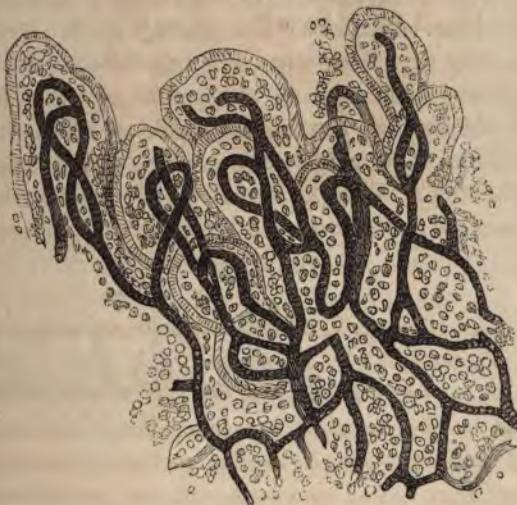
the vascular loops of the villi, and the layer of epithelium covering the villi, are represented.

The thick layer of epithelium, and the villi with their looped vessels, appear to be the principal anatomical features of the mucous membrane of the os uteri and external portion of the cervix; and it will be seen in the sequel that both villi and epithelium play an important part in the pathological changes which occur in the lower segment of the uterus in leucorrhœa, and in abrasions of the os and cervix uteri.

Villi of the lower part of the Canal of the Cervix Uteri.—On passing within the os uteri, to examine the mucous membrane lining the cervical canal, a small tract of smooth surface is generally found between the margin of the lips of the os uteri and the commencement of the penniform rugæ. Sometimes, however, there is only a slight rim between the os uteri and the lower rugæ; and occasion-

ally the rugæ extend so low down that they may be seen at the os uteri itself. When the smooth surface now spoken of exists, as it does in most specimens to some extent, the mucous membrane appears to the naked eye more delicate and vascular than the mucous membrane of the external portion of the os uteri. But whether rugose or smooth, the mucous membrane of this portion of the cervix consists of the same elements, except that wherever rugæ are present mucous follicles are found in great abundance. When examined by the microscope, the mucous membrane immediately within the os uteri is found to be composed of cylinder epithelium arranged upon villi, somewhat after the manner of the epithelium covering the villi of the intestinal canal, of basement membrane, and of sub-mucous tissue. The villi in this situation are three or four times

FIG. 6.



Villi of canal of the cervix uteri, covered by cylindrical epithelium,
and containing looped bloodvessels. 100 diameters.

larger than the villi of the external portion of the os uteri. Like the villi of the os uteri, the villi of the canal of the cervix are occasionally compound, consisting of two or three or even four villi arising from a single stalk. They contain looped bloodvessels, and, in some specimens, two or three of the vascular loops may be seen in a single villus where the villi are of large size. They are covered as well as the spaces between them with cylinder epithelium, dentated in shape,

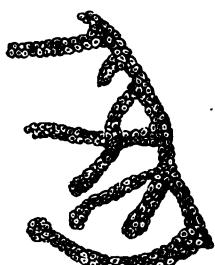
and arranged with great regularity. At the bases of the villi, their bloodvessels inosculate freely, as in the case of the villi upon the external surface of the os uteri.

I first saw the villi or papillæ of the os and cervix uteri while making an examination with Dr. Handfield Jones, but I found that they had been previously observed, and a drawing made of them by Dr. Hassall. After the reading of my Memoir on the Pathology and Treatment of Leucorrhœa, in June, 1852, at the Royal Medical and Chirurgical Society, Mr. Kiernan informed me that he had long been aware of their existence, and had often felt surprised that no account of them had been published. My attention was subsequently directed by the referees of my paper to a description of the villi of the os and cervix, in a very able essay by the late Dr. Franz M. Kilian, of Bonn, on the structure of the uterus in animals, entitled, "Die Structur des Uterus bei Thieren," and published in vol. ix. of Henle and Pfeifer's "Zeitschrift," 1850. Dr. F. Kilian, in his paper, after describing what he terms the sensitive papillæ of the vagina, gives a description of the papillæ of the os and cervix uteri, and of the cervical canal. He speaks of these structures as being threadlike or filiform upon the os uteri, and considers them as sensitive in function. What he terms sensitive papillæ within the os uteri, are described as tuberculated in shape, as considerably larger

FIG. 8.



FIG. 7.



Villi of the vagina.

FIG. 9.



Villi of the canal of the cervix uteri.

than the filiform papillæ of the os uteri, and as being deeply imbedded in the mucous membrane. At the upper part of the cervical canal the papillæ are said to approach again in shape and size to the papillæ

of the os uteri. Rude lithographic figures of the papillæ, as seen by a low power, are appended to Dr. F. Kilian's paper; but they do not exhibit, with accuracy, the intimate structure of these bodies. The figures on the opposite page are copies of the engraving of the villi contained in Dr. F. Kilian's essay.

M. Jobert was of opinion that the upper part of the cervix uteri is supplied with nerves, which pass from thence to the vagina, leaving the os and cervix uteri destitute of nerves. In this way he explained the absence of pain, upon the application of escharotics and the actual cautery, to the os uteri. Dr. F. Kilian doubted the correctness of this view of M. Jobert, and this doubt led him to the examination of the structure of the os and cervix uteri. Dr. F. Kilian assumed that as papillæ are the organs of sensibility, there must be sensibility and consequently nervous filaments wherever papillæ are present; and finding papillæ in the mucous membrane of the os and cervix, he concluded that there must be nerves of sensation in this part of the body. He could not, however, demonstrate their presence with the microscope. The fact that the os uteri is, in ordinary conditions, comparatively insensible to pain, he met by supposing that its nerves are fitted to receive pleasurable sensations, and that the nerves of the cervix uteri are not under ordinary circumstances susceptible of painful impressions.

It becomes a question of much interest to decide what are really the functions performed by the villi of the vagina and the os and cervix uteri. In the lower part of the vagina, the papillæ are no doubt sensitive in function, and deserve the term applied to them by Dr. F. Kilian; but in the upper part of the vagina, the mucous surface is, in the healthy condition, possessed of little sensibility either to pleasure or pain; yet the papillæ or villi are very abundant. The villi are present in very great abundance upon the os uteri and the external portion of the cervix; though the os uteri is, in the majority of cases, insensible to the touch. It is only when the os or cervix uteri is distended by instruments, or when the cervical canal is inflamed or constricted, that pain is caused in ordinary cases. The villi are largest and more highly developed within the os uteri, where sensation is more blunted than in any part of the vagina or os uteri. For these reasons, I am inclined to believe that the villi of the os and cervix uteri, particularly the villi of the cervical canal, are little concerned in sensation. From the liberal supply of blood possessed by the villi, I suspect they are concerned

in the secretion of the fluid plasma which the external portion of the os and cervix and the upper part of the vagina pour out, and which forms the vehicle in which the epithelial *débris* is suspended; or they may be intended for the formation of the thick layer of epithelium covering these parts, and which is in constant process of renewal and disintegration. Some original researches, which have excited considerable attention in Germany and this country, have recently been published by Dr. Rudolphe Wagner, in Müller's Archiv. for 1852, on the sensitive papillæ of the skin, and may perhaps be brought hereafter to bear upon the point at issue. Wagner gives, as the result of his researches, which have been verified by Kolliker and others, that the vascular and tactile papillæ, are different structures. A certain number of the cutaneous papillæ contain vascular loops, but they contain no nerve-tubes. Other papillæ contain a nervous loop ending in an oval *corpusculum tactus*, but no vascular loops are found in these sensitive papillæ. Dr. Hassall and myself saw nothing like the sensitive papillæ of Wagner among the muscular papillæ of the os uteri; and their absence may, perhaps, explain the discrepancies between the views of Jobert and Kilian. The papilla of the os and cervix may be almost entirely vascular. The practical results are, however, little affected by these questions. The os and cervix uteri are undoubtedly covered by epithelium, which may be abraded, and it undoubtedly contains papillæ or villi, which, when denuded or hypertrophied, may present all the appearances of granulations, and have probably been mistaken for them. The large vascular loops contained in the villi of the os uteri, and particularly of the lower part of the canal of the cervix, also afford the explanation of the sanguineous discharges from the os and cervix uteri, so frequently met with in cases of leucorrhœa.

Underneath the villi, both in the lower part of the cervical canal and upon the external surface of the os and cervix uteri, a dense fibrous and vascular tissue is found, mixed with nerve-fibres and involuntary muscular fibres and nuclei, the muscular fibres becoming more plentiful on descending deeply into the structure of the walls of the cervix. In the villi themselves are numerous oil-globules, many of them of large size, as well as an abundance of granular cells; these elements are situated between the looped bloodvessels and the basement membrane.

CHAPTER II.

THE GLANDULAR STRUCTURES OF THE CANAL OF THE CERVIX
UTERI.

THE descriptions hitherto given of the canal of the cervix uteri, in anatomical works, have been very meagre and insufficient; certainly not at all commensurate with its importance both in a physiological and pathological point of view. Obstetricians have rivalled systematic anatomists in the brevity with which they have dismissed this subject. In recent times, the os uteri and the external portion of the cervix, have so far eclipsed the cervical canal in importance that the latter is scarcely referred to by writers on leucorrhœa.

One of the best accounts with which I am acquainted in any English work is contained in the last edition of Dr. Quain's "Elements of Anatomy." I quote from this description the passages relating to the glandular structure of the cervix:—

"That portion of the (uterine) cavity which corresponds to the neck, resembles a tube slightly flattened before and behind; it is somewhat dilated in the middle, and opens inferiorly into the vagina by the os tincæ. Its inner surface is marked by two longitudinal ridges or columns, which run one on the anterior, the other on the posterior wall, and from both of which rugæ are directed obliquely upwards on each side, so as to present an appearance which has been named *arbor vitæ uterinus*, also *palmæ plicatæ*."

"The mucous membrane which lines the uterus is thin, and closely adherent to the subjacent substance, especially in the body of the organ. It is continued from the vagina into the Fallopian tubes. Between the rugæ of the cervix, already described, it is provided with numerous mucous follicles and glands."

This, it must be confessed, is very brief; but, although the subject is treated of in almost every systematic treatise on midwifery, it is seldom that any further description is met with. No obstetrician has, so far as I am aware, described the cavity of the cervix

more minutely than Professor Paul Dubois, in the first volume of the great work he is still engaged upon, "Traité de l'Art des Accouchements," the first part of which was published a few years ago. His description is as follows :—

"The cavity of the cervix represents a small elongated canal, flattened and fusiform, dilated towards its centre, and becoming narrower at the extremities. Its two walls, one of which is anterior and the other posterior, present each at the median line a longitudinal eminence or crest, which appears to be the continuation of the less marked ridges existing in the walls of the cavity of the fundus. From each of these crests, numerous folds are given off laterally; these are thick, regularly arranged one above another, and less united at the centre than at the extremities. They take a somewhat oblique direction upwards and outwards, towards the lateral walls of the canal, where they terminate at another vertical but less apparent line. Thus arranged, these folds seem to be formed between the two vertical crests, like oblique steps of a ladder, and are a little concave above: the meeting of these branches, which somewhat resembles a fern leaf, has been termed the *arbor vītæ*.

"Between these folds rather deep grooves are seen, which are occupied by a great number of mucous follicles. The excreting orifices of these glands are frequently obliterated by accidental causes, and, the mucus accumulating in their cavities, they acquire a remarkable development. In this state they were taken, by an ancient anatomist, Naboth, for human ovules; and even at the present day, though their real structure is well known, they are still frequently designated as the ovules of Naboth."

Sir Charles Clarke, whose work on the "Diseases of Females" has never been excelled, described the cervix uteri in three or four sentences. He entertained a correct idea of the structure and functions of this part of the body, though he was far from seeing its importance in the pathology of leucorrhœal disorders. He states :—

"The cervix of the uterus is beset with a number of glands. These glands are more readily discernible in women who have died pregnant; and in some bodies they are probably much more numerous than in others. . . . The cervix of the uterus is a glandular part; its secreting organization can be demonstrated. It is subject

to the diseases of glands in other parts of the body, and in all probability will be particularly liable to take on disease in habits which are prone to other glandular complaints—namely, in weak habits. The majority of cases of disease in the breast, and in the testicle, arise in such persons."

In vols. xvii. and xviii. of the *Archives Générales de Médecine* (fourth series), M. Charles Robin has published an historical memoir on the anatomy and pathology of the mucous membrane of the uterus, in which he gives a minute account of the mucous surface of the cervical canal and its mucous follicles. M. Robin states that mucous glands are present in the cervix, from the limit separating the cavity of the fundus from the cervix, down to the os tincæ. The orifices of these glands are said to be visible on the rugæ of the arbor vitæ, as well as in the grooves between them, but to be most numerous in the intervals between them. He observes that the microscope reveals many more than can be seen with the naked eye. The glands themselves are described, not as simple mucous follicles, but as small cylindrical tubes terminating in a round cul de sac, the tubes and their terminal cul de sac being compared in shape to a bottle or phial.

Rugæ of the Cervical Canal.—A careful examination of the canal of the cervix uteri itself will, however, show that even the most careful of these descriptions are imperfect. When the cavity of the cervix belonging to a virgin uterus is laid open by a longitudinal incision, so as to expose the whole of the cervical canal, the internal surface is generally found to contain four columns of rugæ, or folds of mucous membrane, the rugæ being arranged in an oblique, curved, or transverse direction. Between these columns of rugæ, four longitudinal grooves or ridges are usually seen. In some specimens, grooves; in others, ridges are present. Of these, the two grooves or ridges in the median line, anteriorly and posteriorly, are the most distinct. The other longitudinal markings are situated, one on each side, between the anterior and posterior walls of the cervix, beginning below at the angles dividing the anterior and posterior lips of the os uteri. The canal of the uterus is flattened in shape, and two of the rugous columns are arranged on the anterior surface, corresponding to the anterior lip, and the other two upon the posterior lip; the posterior half of the cervix being the largest of the two, and containing the greatest number of rugæ.

The sulcus or division between the posterior rugous columns is also generally more strongly marked than the sulcus dividing the anterior rugous columns. The rugæ of each column as seen by the eye alone, vary from about ten to fifteen in number. In the intervals between the columns, numerous small longitudinal folds may be seen, but these are less distinct than the transverse rugæ. In the healthy state, the transverse rugæ, with the fossæ between them, are covered with a viscid and transparent mucus; and when this is brushed away, a reticulated appearance, caused by numbers of secondary rugæ, is visible in the mucous membrane beneath. The secondary rugæ run in various directions without much regularity. In some parts of the fossæ the mucous crypts are deeper than usual, and here and there minute openings are seen at the bottom of the pits, into which fine bristles may be passed to the distance of the twelfth of an inch or more. Besides the four rugous columns and the furrows between them, which are found in the well-developed cervix, other rugæ of irregular shape are seen, particularly at the upper and lower portions of the cervix, where the regular, transverse, or oblique rugæ become indistinct. The cervical rugæ have been compared to a tree, a feather, or a fern leaf; but when the whole cervix belonging to the uterus which has never been impregnated is displayed, it is not unlike an open book in miniature, printed in double columns.

FIG. 10.



The cavity of a virgin cervix uteri, laid open. Natural size.

Although the columnar arrangement now described is generally met with in the cervix uteri in women who have not borne children,

specimens of virgin uteri are sometimes seen in which the cervix presents a cribiform appearance, instead of the arrangement of transverse rugæ, with fossæ, between them; or there may be a less number of rugous columns than four, from the absence of some of the longitudinal sulci, or ridges. When the follicles are arranged in a cribiform manner, they enter more deeply into the structure of the cervix, and are collected together in pouches instead of furrows. I have seen one or two instances in which the follicular structure of the cervix extended down to the os uteri, and the rugæ, instead of being arranged transversely, were found in the form of radiating laminæ round the os uteri. In some specimens, the rugæ of the whole cervix are arranged closely together, as thin laminæ, with deep divisions between them.

In the virgin state, the arrangements of the mucous membrane above described occur with tolerable regularity; but, after pregnancy and child-bearing, they become, to some extent, confused and irregular, though the follicular structure remains. The less regular disposition of the cervix in multiparous women is not to be wondered at, when we consider the changes which occur from the development of the cervix in pregnancy, and the great dilatation of this part of the uterus during the passage of the child in parturition. Probably it is owing to the great extent of the reduplication of the mucous membrane of the cervix that laceration of the mucous surface of the cervix does not occur more frequently during labor. In pregnant women, or in cases where the cervix uteri is unusually developed, as in long standing leucorrhœa, polypus, prolapsus, or procidentia, the rugæ or folds are considerably increased in size, or they are unfolded to a considerable extent. Probably all the rugæ of the cervix disappear during labor from the unfolding of the rugæ, just in the same way as the *columnæ rugarum* and the transverse rugæ of the vagina are obliterated from the same cause. In one case of polypus of the uterus which I examined after death, where the tumor was contained in the fundus uteri, but in which the cervix had shared in the increased growth of the organ, the rugæ and follicles of the cervix were increased in size. In another case, in which a large polypoid growth occupied the cervix uteri, the cervical canal was thinned out to a great extent, and the situation in which the rugæ are usually found was perfectly smooth, from the gradual unfolding of the mucous membrane. In the young child,

the cervix uteri bears a greater proportion to the rest of the organ than in middle life, and the arbor vitæ is seen very distinctly. In old age the whole of the structures of the cervix and fundus uteri shrink to a great extent.

The foregoing is a description of the mucous surface of the cervix uteri, such as it appears on a careful examination with the naked eye alone. In all anatomical works, mucous follicles and lacunæ are mentioned as being numerous in the canal of the cervix uteri and between the pinniform rugæ; but the subject is, as I have already observed, generally dismissed in a few words, and I am not aware that any exact description of the cavity of the cervix uteri and the arrangements of the mucous membrane, as they may be seen even without the aid of a lens, has been hitherto given. Names too often hide the real significance of things, and the terms, *pinniform rugæ*, *glandulæ Nabothi*, *palmæ plicate* and *arbor vitæ uterinæ*, would seem in this instance to have been received in lieu of more accurate descriptions.

Glandular Follicles of the Cervical Canal.—If the above be true of the cervix uteri as it may be examined by the naked eye, we have been still more ignorant of the anatomical arrangement of its mucous membrane as seen by the microscope. If we take a section of a virgin cervix uteri, containing one of the longitudinal columns only, and magnify it nine diameters, we obtain a clear insight into the glandular structure of the cervical canal. The transverse ridges now stand out with great prominence. Besides the primary rugæ, each fossa is seen to be subdivided by smaller rugæ, from which curved septa, still more minute, take their origin, dividing the principal fossæ into a great number of crypts, arranged like a fine piece of network. In each of the fossæ between the primary rugæ, as many as from forty to fifty crypts or laminæ may be seen. A cervix of moderate size would show between the transverse rugæ of the four columns alone, with this low magnifying power, from two to three thousand follicular pits. But, besides the fossæ between the rugæ, the spaces between the rugous columns and the longitudinal sulci themselves, are all seen to be covered by multitudes of mucous follicles. Small plicæ are everywhere visible, and these are evidently only a repetition of the columnar rugæ, on a lesser scale. This is particularly the case with respect to the larger

extremities of the transverse rugæ, all of which are closely studded with mucous pits.

FIG. 11.



One of the four longitudinal columns of rugæ from the virgin cervix.
9 diameters.

If a portion of the cervical mucous membrane be magnified still further to the extent of eighteen diameters, so as to take only two or three of the primary ridges and fossæ into the field, it will be seen that the rugæ themselves, and even the secondary septa, are covered in the greater part of their length with mucous follicles.

The crypts in the furrows are still further divided and subdivided, so as to double or treble the number of follicles and laminæ seen with the lower power. In a portion of the cervix, comprising only

FIG. 12.



Two of the transverse rugæ, with one perfect fossa between them,
from the virgin cervix. 18 diameters.

three rugæ, and their two interspaces, upwards of five hundred mucous follicles were easily counted, so that it is within the limits of moderation to say that a well-developed virgin cervix uteri must contain at least ten thousand mucous follicles; indeed, even this number is probably greatly exceeded.

When a longitudinal section is made through the middle of one of the rugous columns, and viewed laterally, fossæ are found to extend obliquely and deeply into the substance of the cervix, sometimes to the extent of the sixth of an inch or more; and occasionally mucous openings pass into the centre of the walls of the cervix, and may be seen filled with the tenacious mucus proper to the cervical

canal. These irregular cavities are sometimes obstructed, and contain masses of inspissated mucus, the openings leading to the cervical mucous surface having become closed.

Besides the anatomical arrangements already described, the superficial surface of this part of the mucous membrane of the cervical canal is further increased by the presence of villi similar to those found in the lower part of the cervix. These villi extend to the glandular surface of the canal, and are found in considerable numbers on the larger rugæ, and other parts of the mucous membrane in this situation. Thus the entire organization and disposal of the mucous membrane lining the canal of the cervix uteri is such as to afford a very large extent of glandular surface for the purposes of secretion. In effect, the cervix uteri is an open gland, and it performs, as will hereafter be shown, all the functions fulfilled by glands in other situations.

FIG. 13.



Side view of one of the columns of rugæ and fosseæ.
6 diameters.

Another purpose served by the reduplications of the mucous membrane of the cervix uteri I have already alluded to—namely, the dilatation of the cervix uteri during labor, without laceration. In pregnancy, the cervix uteri is enlarged and unfolded considerably

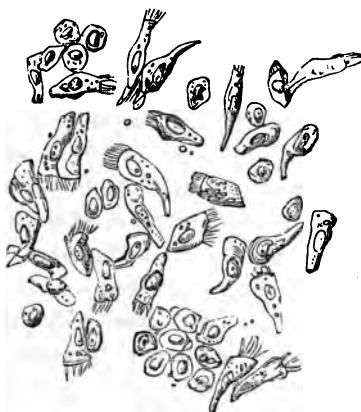
by the processes of growth, and in this enlargement the rugæ take part; but nevertheless, at the time of parturition, a large amount of distension takes place during the passage of the fœtus. Without some such provision as that offered by the rugæ of the cervix, laceration of the mucous membrane would be a frequent occurrence. During pregnancy the rugæ are enlarged and loosened; but when the os uteri is fully dilated in labor, the mucous membrane of the cervix may be felt perfectly smooth, no doubt from the unfolding of the rugous mucous membrane. In this respect, as I have already said, the rugous arrangement of the mucous membrane of the cervix uteri may be compared to the rugous arrangement of the mucous membrane of the vagina.

I may here refer to a point which should not be lost sight of, bearing, as it does, upon the pathology and treatment of leucorrhœa, and some other disorders of the os and cervix uteri—namely, the great similarity which exists between the skin and the mucous membrane of the vagina, and of the external portion of the os and cervix uteri. The resemblances of the mucous membrane in these situations are certainly much nearer to the cutaneous structures than to the mucous membranes of more internal parts. This is particularly the case with respect to the dense epithelial layer of the vagina and os uteri; and the villi of the os uteri are perhaps more nearly allied to the papillæ of the skin than to the villi of the intestinal mucous membrane. The surface of the vagina, and the external portion of the os and cervix, like that of the skin, is constantly acid; while within the cervical canal the surface is as constantly alkaline. These analogies are strongly confirmed by what is observed of the pathological lesions to which these parts are liable, and by the effects of therapeutical applications. Several of the common skin affections are closely imitated on the vaginal surface and the vaginal portion of the cervix uteri, and give way to treatment adapted for genuine skin diseases. It is also well known that when inversion of the vagina occurs, as in procidentia uteri, the secretion of vaginal mucus is suspended, and the epithelial layer of the vagina becomes hard, and similar to epidermis.

The epithelium found upon the follicular surface of the canal of the cervix is cylindrical or dentated, like the epithelium just within the os. It is also ciliated low down in the cervix, but not at its very lowest part, and the ciliated character is continued into the

cavity of the fundus uteri. The villi found in the upper portion of the cervix are covered by dentated epithelium, just as is the case with the villi of the lowest part of the cervix. Mixed with the epithelium of the follicular surface of the cervix, a considerable number of caudate corpuscles are frequently found, each having a distinct central nucleus. These are probably nothing more than altered epithelial particles. The epithelium of the os uteri and external portion of the cervix is, like that of the vagina, constantly squamous; the epithelium just within the os uteri is cylindrical but not ciliated. Various opinions have been held respecting the point at which the squamous epithelium becomes changed for the cylindrical, and also respecting the point at which cilia are first found. The above is the result, however, of the examination of many uteri, made as early as possible after death, so as to anticipate the alteration of the cilia and epithelium by post-mortem changes. The situation in which cilia are first found in ascending the utero-vaginal tract varies a little in different subjects, but I believe it will be found that the transition from squamous to dentated epithelium constantly occurs just at the margin of the os uteri.

FIG. 14.



Ciliated cylinder epithelium, from the canal of the cervix uteri.
420 diameters.

I have thus referred in detail to all the structures which can possibly be concerned in the production of ordinary leucorrhœa. The mucous membrane of the fundus uteri need not now be referred to,

since, however important it may be with respect to the disorders of menstruation, it is seldom, I believe, the source of leucorrhœal discharges. It will be seen that from the nymphæ to the entrance of the fundus uteri, the glandular structures are arranged at two principal stations—namely, at the ostium vaginalæ, or the cervix vaginalæ, as it might be called, and at the cervix uteri. There is no apparatus for any considerable mucous secretion in the space between these two points.

What I next propose to do is, to give some account of the natural secretions of the different parts of the utero-vaginal mucous membrane already described, in the unimpregnated state, in pregnancy, and in parturition—the physiology, in fact, of the mucous lining of the vagina and cervix uteri; and then to proceed to the disordered secretions of the same surfaces, and the lesions which produce and follow them.

CHAPTER III.

THE SECRETIONS OF THE VAGINA AND OF THE OS AND CERVIX
UTERI AND THE CERVICAL CANAL, IN THE HEALTHY STATE.

THE sebaceous follicles or fat-glands of the vulva and external parts of generation, secrete an oily matter, which, when it is secreted in unusual quantities, or in persons not observing strict cleanliness, may be seen gathered between the folds of the nymphæ as white fatty matter. Examined by the microscope, nothing is seen but masses of sebaceous secretion, in the form of fat, mixed with a profusion of scaly epithelium from the surrounding surfaces. The secretion of these glands is highly acid, and emits the peculiar odor which characterizes the external genitals. The obvious uses of this sebaceous secretion are to defend the vulva from friction, and to preserve the surface from the irritation of the uterine and vaginal secretions, and of the urine. The fat-glands of the vulva are more concerned in the eruptive conditions of the genital aperture, than with leucorrhœal discharges. Dr. Hassall has observed that the sebaceous glands in this situation, present the peculiarity, that after maceration they frequently come away entire in connection with the epidermis. This appears to show that they are of very simple construction, and consist of cells placed in pouches having two or three divisions, in the epidermis. When the internal surface of a piece of epidermis of the vulva separated by maceration is examined, the glands are seen distinctly, and the white transparent points into which the papillæ have been inserted are plainly visible.

Mucus of the Ostium Vaginæ.—The secretion of the mucous glands of the ostium vaginæ is said to be connected with the sexual function, and to be increased under excitement. In some women, a profuse emission of fluid appears to take place from these glands during sexual intercourse. The secretion from these glands, in the absence of excitement, is so inconsiderable, or it is so mixed up

with the scaly epithelium of the mucous surface in this situation, that it is extremely difficult to ascertain precisely its microscopical

FIG. 15.



Sebaceous follicles after a drawing from a preparation by Dr. Hassall. The dark bodies are the sebaceous glands, the white spaces are the depressions in which the papillæ have been received. 18 diameters.

qualities. Like the other vaginal secretions it has an acid reaction. Modern anatomists have chiefly followed the descriptions of Bartholine and Duverney, in their descriptions of these glands, with the exception of M. Hugnier, who has written at considerable length on the diseased conditions to which the vulvo-vaginal glands are subject. I have often endeavored to obtain some of the secretion of the muciparous glands said to exist in this situation, but have failed to find anything beyond large quantities of scaly epithelium and plasma. I have also tried to procure some of the glandular secretion after death, for microscopical examination, but I have hitherto been unsuccessful. I suspect the importance of these glands with respect to leucorrhœa has been greatly overrated.

Vaginal Mucus.—The mucus of the Vaginal Canal is not found in any considerable quantity in the healthy subject; it is only secreted in sufficient quantity to keep the mucous surface in a state of lubrication. It lies upon the mucous membrane as a milky fluid, containing quantities of small curdy points or masses, and consists of a transparent or semi-transparent plasma, containing an abun-

dance of scaly epithelium and its *débris*. In the natural condition of the part, the epithelial scales are either mature or beyond the period of maturity and wearing away. But when the vagina is in a state of irritation, the epithelium is shed more rapidly, and cells of all sizes, from mere nuclei up to perfect scales, are found in great quantity in the vaginal secretion. The plasma of the vaginal mucus appears, when first secreted, to resemble the plasma of the cervical mucus, but it is less viscid and tenacious. It is only after it has lain a short time upon the vaginal surface that it becomes curdled. The vaginal mucus is, as M. Donné first remarked, distinctly acid, and it is to the effect of the acid in coagulating the albumen of the mucus, and not to the presence of epithelium, that its curdled appearance is attributable. It is said that the rugæ of the vagina have an effect in increasing the sexual stimulus, and it is not improbable that the acid secretion acts in the same manner. M. Donné also long since pointed out that, in the healthy acid mucus of the vagina, the spermatozoa preserve their vitality for a considerable time, but that they are speedily destroyed when the acid of the vagina is in excess from any cause. This excess is produced by any considerable irritation of the vagina, and has no doubt an important bearing on the existence of sterility in certain cases. For the microscopical characters of vaginal mucus, I may refer to Fig. 1, page 22.

M. Donné made the observation that the secretion upon a surface covered by squamous epithelium is always acid, while the secretion upon a surface covered by cylindrical epithelium is always alkaline. Dr. Whitehead, of Manchester, in his work on "Abortion and Sterility," also states, that the mucus of the vagina constantly possesses acid qualities, and that the discharges from the interior of the uterus are as constantly acid. These points I have verified by numerous trials. In the ordinary state, I find, moreover, that the secretion, not only of the vagina, but of the os and external portion of the cervix is acid, while within the labia uteri it becomes alkaline. If a piece of litmus paper be applied to the surface of the os uteri, it is instantly reddened, but the blue color is restored by passing it just within the cervix. The margin of the cervical canal, and the limits of the villi covered by squamous epithelium, and the commencement of the villi covered by cylinder epithelium, seem to mark the division between the acid and alkaline secretion,

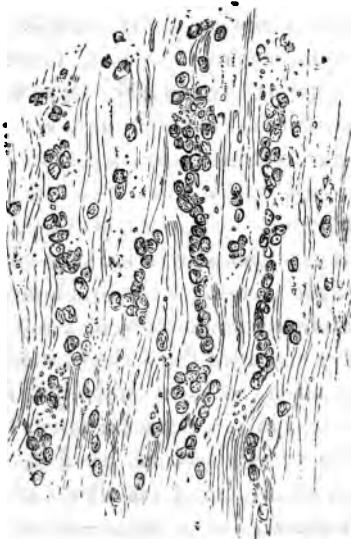
and is thus a confirmation of the rule laid down by M. Donné. Dr. Whitehead further points out that the acid of the vagina coagulates the vaginal mucus, but prevents the coagulation of the menstrual fluid. On the latter property he lays great stress, and believes that but for this provision the menstrual secretion, instead of being discharged in a fluid state, would be retained in the vagina, at the risk of putrefaction and serious mischief to female health. It will not escape observation, that the portion of the mucous membrane of the uterus and vagina which resembles the skin, is the only part which, like the skin, furnishes an acid secretion. The different chemical conditions of the uterine and vaginal secretions is of considerable importance, for it will be seen that some of the most puzzling circumstances relating to the discharges in leucorrhœa have been caused by these conditions.

Mucus of the Cervical Canal.—As regards secretion, the vagina is always pretty much in the same condition, except that the acidity is constantly increased during pregnancy; but the cervix uteri has to pass through various physiological changes during the performance of the functions of Menstruation, Pregnancy, Parturition, and Lactation. It becomes necessary, therefore, to consider the secretion of the canal of the cervix in these several states.

Cervical Mucus in the Unimpregnated state.—In the unimpregnated condition, when the cervix uteri is found perfectly healthy, little or no discharge is seen issuing from the cervical cavity; but when the labia uteri are separated, the canal of the cervix appears to be full of its peculiar secretion. In examinations after death, in cases in which the uterine organs are in a healthy condition, the mucous crypts and the canal of the cervix are generally found filled with a clear, viscid mucus, so as to entirely block up the passage from the vagina to the cavity of the fundus. This appears to be the normal condition of the cervical canal in the unimpregnated state. At each catamenial period the whole of the tenacious plug of mucus must be washed away by the menstrual fluid, as the latter may be seen escaping freely from the os uteri at these times; but in a few days after the completion of the period, the mucous plug is again formed. When first secreted, the cervical mucus is less thick and viscid than it afterwards becomes. Thus it would seem to be the function of the glandular structure of the cervix, in the unimpregnated uterus, to secrete each month a sufficient quantity of

viscid mucus to fill the canal of the cervix, the mucous follicles becoming comparatively inactive when this has been accomplished, until after its removal at the next flow of the catamenia. The function of the cervix is, therefore, in a certain sense, like that of the fundus, periodical; and we shall see hereafter that this periodicity is discernible in the diseased conditions of the cervix and its secretions. In healthy subjects, the canal of the cervix is always full in the intervals between the menstrual periods, though there certainly seems nothing like a constant flow of the cervical mucus into the vagina. Just enough is secreted to fill the canal. The mucus itself consists of myriads of mucus-corpuses entangled in a transparent viscid plasma. The plasma is so tenacious, that the mucus-corpuses are found to be arranged in strings when placed under the microscope, and individual corpuscles are frequently seen to be elongated from the same cause.

FIG. 16.



Mucous discharge from the healthy cervix uteri, taken from the mucous crypts. The mucus-corpuses are arranged in strings by the viscosity of the plasma in which they are entangled. 220 diameters.

The use of the cervical mucus is probably twofold. In the first place, it closes the cervix uteri, and defends the cavity of the

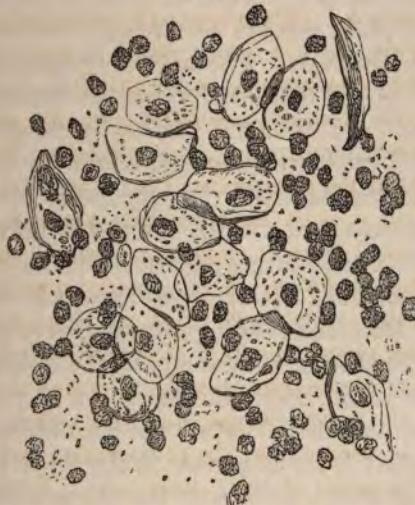
fundus from external agencies as completely as though it were a shut sac. In the second place, it appears to afford a suitable medium for the passage of the spermatozoa through the cervix uteri into the uterine cavity.

In the article on the Vesiculæ Seminales, by Mr. S. R. Pittard, in the "Cyclopædia of Anatomy and Physiology," Mr. Pittard suggests the ingenious hypothesis, "that the office of the vesiculæ is to secrete and keep in store a mucus of such a nature as is congenial to spermatozoa." He shows conclusively that the seminal fluid secreted by the testicle is very small in quantity, and that it is largely diluted by the mucous secretion of the vesiculæ. Now, the secretion of the vesiculæ seminales, like the secretion of the cervix uteri, is viscid, transparent, and alkaline. It is worthy of notice that just after the completion of the menstrual flow, the time when impregnation is most likely to take place, is also the time when the cervix uteri is most empty, or when its mucous contents are in the most fluid condition. During intercourse the spermatozoa are deposited at the os uteri, and there can be no doubt that when impregnation takes place some days after the completion of menstruation, the spermatozoa have to make their way through the plug of mucus filling the cervical canal, and it is a plain inference that this mucus must be adapted for the preservation and ascent of the spermatozoa to the cavity of the fundus uteri. To this progress of the spermatozoa upwards, the movements of the spermatozoa themselves, and the action of the cilia in the upper portion of the cervical canal, no doubt contribute. The viscid secretion of the lower part of the cervix always contains some scaly epithelial particles, which have probably ascended from the os uteri. But I have seldom, if ever, found any cylindrical epithelium in the mucus of the cervix, though the villi in this situation are covered with this kind of epithelium. The cervical mucus, as I have before stated, is, when in the normal condition, almost always alkaline.

Cervical Mucus during Pregnancy.—After the commencement of Pregnancy, the periodical functions of the uterus cease, and in the generality of cases the plug of viscid mucus, when it is once formed, continues for the most part unremoved up to the commencement of labor. The chief changes which occur in the plug depend on the alterations taking place in the cervix uteri itself. At first the mass of mucus has the form of an elongated plug, which fills up

the gradually enlarging canal of the cervix; and in cases of death during pregnancy, it may be drawn out entire. After the early months of pregnancy have passed, and as the cervix is developed so as to become a part of the general cavity of the uterus, the mucous plug is shortened, and at the end of pregnancy it simply fills the os uteri and the lowest part of the cervix. Generally, during

FIG. 17.



Portion of mucous plug taken from the lowest portion of the cervical canal of gravid uterus, consisting of scaly epithelium, mucus-corpuscles, and plasma. 220 diameters.

gestation, the lowest part of the plug is to a slight extent constantly wearing away, and is discharged in the form of *débris* into the vagina; but the secretion from the cervix goes on only to such an extent, as to keep the os and cervix closed. In other cases, the secretion is more profuse, but the cervix is still kept full by an increased secretion from the glandular structures. The mucous plug formed during pregnancy is firmer than the mucus filling the cervix in the intervals between the monthly periods in the unimpregnated state, particularly at its lowest part, where it is perfectly white and opaque. In the upper parts of the cervix it is clear and transparent. The plug consists, in the upper part of the cervix, entirely of mucous globules and plasma; but in the lower portions of the plug these elements are mixed with scaly epithelium in considerable quantity.

Though the os may be partially dilated, I have found it impossible to take any part of the mucous plug away without at the same time removing scaly epithelium. (Fig. 17.) The epithelium is so intimately mixed with the mucus-corpuscles and plasma, that I have no doubt it ascends from the os uteri and vagina, and enters the lowest part of the cervix. In the upper part of the cervix the secretion is alkaline, but the lower part of the plug gives an acid reaction. This acidity is owing to the effect of the acid secretions of the os uteri and vagina, which come in contact with the lowest part of the mucous plug of the cervix. The acid coagulates the albuminous matter of the plug, and it is in this way that the lowest portion is rendered white and almost solid. The uses of the plug during pregnancy are evidently to keep the os and cervix uteri sealed, and to prevent to a considerable extent the entrance or escape of matters to or from the uterine cavity. This account of the functions of the glands of the cervix uteri during pregnancy applies only to ordinary and healthy cases. As I shall have to show, when I come to the consideration of leucorrhœa during gestation, very great deviations from the normal conditions, both as regards the quantity and quality of the cervical secretion, may take place.

I may here mention that I believe the pure white mucous secretion above described is rarely present in the lower part of the cervical canal in any other condition of the uterus besides pregnancy. It becomes, therefore, of some importance as a sign of utero-gestation, particularly in the early months. In the following cases it was of service in confirming the existence of pregnancy, when some of the ordinary signs were doubtful or absent.

CASE I.—*The White Mucous Plug as a Sign of Pregnancy.*—I examined, in December, 1852, a lady who did not believe it possible that she could be pregnant. The catamenia had been absent for three months, but they had been scanty for some time previously. The mammary signs were indistinct. She had borne several children, and the abdomen was so full and pendulous that nothing could be made out from an external examination. On examining, per vaginam, the os uteri was found to possess the peculiar softened feel of early pregnancy, and the uterus was evidently enlarged. The os uteri and lower part of the cervical canal were full of the bright white curd formed by the coagulation, *en masse*, of epithe-

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lium, mucus-corpuseles, and plasma, by the vaginal acid. The appearance was very much as though a plug of white paint had been inserted into the os. I had no doubt of the existence of pregnancy, and in about a month afterwards this patient aborted.

CASE II.—*The Cervical Secretion in Doubtful Pregnancy.*—I saw with Dr. Aldred, in March, 1853, a patient who had miscarried six months before at the fifth month. This was the only occasion on which she had been pregnant. Shortly after the abortion, there was considerable swelling of the abdomen, but this subsided slowly, though she continued larger than natural. The catamenia did not appear after the abortion, still she suffered no headache, nor was there any pallor of the countenance—symptoms which are so constantly present in amenorrhœa. The nipple was surrounded with a dark areola, the mammary follicles were enlarged, and the superficial veins of the breast plainly visible. This state of the breast she described as having continued from the time of the abortion. There was no morning sickness, nor any irritation of the stomach. She suffered from profuse leucorrhœa; and intercourse was described as being extremely painful. The fundus uteri could be felt midway between the pubis and umbilicus, but neither motion nor sound could be detected. On making a digital examination, the os uteri was soft and expanded, and the lower segment of the enlarged uterus could be distinctly felt. On examining with the speculum, the vagina was found covered by a curdy secretion, and the os uteri plugged with dense white mucus. The epithelium of the os uteri was entirely removed, to the extent of a shilling, showing the enlarged villi, which might easily have been mistaken for granular ulceration. In this case, notwithstanding a profuse secretion of the cervical mucus, the os uteri was kept plugged by the thick white mucus of pregnancy. The acid of the vagina must have coagulated the fresh secretion so rapidly as to keep up the plug. There was afterwards no doubt of pregnancy in this case.

CASE III.—*The White Mucous Plug in Doubtful Pregnancy.*—Towards the end of the year 1852, I saw a lady in whom the catamenia had ceased about two months before, while travelling in Lombardy. She had been married upwards of a year; and since her marriage the catamenia had been scanty, and frequently absent be-

yond the month. She was of pale, amenorrhœal complexion, and extremely anxious lest the menses should leave her altogether. She complained much of pruritus and obstinate constipation, with constant leucorrhœal discharge. The mammary signs of pregnancy were very indistinct. The only indication of pregnancy beyond the absence of the catamenia, and fulness of the body of the uterus, was the presence of the dense white plug at the os uteri. This was very marked; and there was a considerable and highly acid epithelial discharge from the vagina. I gave my opinion in favor of pregnancy. She afterwards went to reside at Brussels, where she was under the care of Dr. Lebeau. This distinguished accoucheur was uncertain as to the existence of pregnancy, and she came to London to be under my care, nearly five months after the last appearance of the catamenia. The movements of a foetus now removed all doubt as to her condition, and she was delivered in June, 1853.

FIG. 18.



A portion of the "show," taken at the commencement of labor, consisting of mucus-corpuscles and blood-globules entangled in viscid mucous plasma. Magnified 240 diameters.

Cervical Mucus During Parturition.—At the beginning of Labor, the "show," as it is termed, makes its appearance. This discharge has been called the leucorrhœa Nabothi, and consists principally of the plug of thick glutinous mucus which has so long sealed

the cervix uteri, mixed with a little blood. The plug is discharged from the cervix in consequence of the incipient dilatation of the os uteri, and the secretion of a quantity of mucus having a more fluid character than the plug of pregnancy itself. This secretion continues throughout the act of parturition. Nothing is more marked during the whole of labor, than the free lubrication of the os uteri and vagina by this mucus. It has been generally considered a vaginal secretion, partly from the fact of its being found upon the vaginal mucous surface, and partly because no minute inquiry into its nature has ever been made. There is, however, no evidence that the vagina secretes much more profusely during labor than at any other time, and there could hardly be a profuse secretion from the vaginal mucous surface, without such a shedding of epithelium as would leave the subjacent structures irritable and painful. Microscopical examination proves that the mucus found in the vagina is chiefly the product of the glands of the cervical canal. At the commencement of labor, the discharge is white and opaque, but as labor proceeds, and after the plug of pregnancy has escaped, it becomes clear and transparent. It is now of the consistence of white of egg, alkaline in character, and consists almost entirely of tenacious plasma and an immense quantity of mucous globules, intermixed with scaly epithelium. The mucus is sufficiently alkaline to neutralize the acid of the vagina, so that during labor the vaginal surface is frequently alkaline. At the commencement of labor, a considerable quantity of blood-globules are present, but these generally disappear as labor proceeds, unless there should be hemorrhagic discharge. Thus the secretion lubricating the vagina during parturition, is almost identical with the secretion of the glandular structures of the cervix uteri in the unimpregnated state, or during pregnancy. The quantity of mucus secreted by the cervix during a prolonged labor is very considerable. These facts respecting the mode in which the vagina is lubricated during labor must modify our views on certain conditions which occur in painful and prolonged parturition. Thus, dryness of the vagina is not, in the first instance, dependent on the state of the vagina itself, but on the arrest of the secretion of the cervix uteri. When the cervical glands have been stimulated to an excessive degree, or have been subjected to long-continued irritation and pressure, their secretion ceases. Upon the completion of natural labor, these glands

continue to secrete with considerable activity, and their secretion forms a part of the lochial discharge. In many cases, the last secretion which appears after the cessation of the lochia, is the viscid secretion of the canal of the cervix. Thus it is, perhaps, during parturition that the glandular function of the canal of the cervix uteri is most actively performed. The glandular element seems of more importance at this time than either in the unimpregnated state of the uterus or during the course of pregnancy. The uses of the secretion in lubricating the os and cervix uteri and the vagina, during labor, are sufficiently obvious. The physiological condition which obtains at this time is also very closely related to the pathological conditions which are present in the most common forms of leucorrhœa.

Cervical Mucus during Lactation.—Mild leucorrhœal discharge is very common during the period of suckling, particularly in women who do not menstruate. The secretion takes place, I have no doubt, chiefly from the glands of the cervical canal. In some cases, it is constant; in others, it occurs only at the monthly periods. It is a common observation that, after labor, the application of the child to the breast causes after-pains, and an increase of the local discharge. Uterine contraction and uterine pain are caused for several days after delivery, every time the child is put to the breast, or the sensation of the draught is experienced. But it occasionally happens that this intimate relation between the breasts and the uterus is preserved to some extent during the whole of lactation, and I have met with some cases in which cervical leucorrhœal discharge constantly occurred whenever the child sucked the breast. Thus, there is a marked tendency to increased secretion from the glands of the cervical canal during lactation. Sometimes the foundation of chronic leucorrhœa is laid at this time, but the increased mucous secretion generally ceases after weaning, and the re-establishment of menstruation. In women who are drained largely by leucorrhœal discharges while nursing, it is often only necessary to direct them to wean the child, and the discharge speedily diminishes.

It may appear superfluous to have entered thus minutely into the nature of the secretions of the different portions of the utero-vaginal mucous membrane, but it was the only way in which the discrepancies of those authors who have written on the same subject could be explained.

Ovules of Naboth.—The mucous crypts of the canal of the cervix, the so-called glands of Naboth, and the ovules of Naboth, have often been confounded together. Hence a fertile source of vagueness of opinion respecting the nature of the cervical mucus. M. Robin, in his elaborate memoir, considers the drop of viscous fluid, which may be expressed from one of the ovula Nabothi, the same in composition as the mucus of the cervix. In his opinion they are so identical, the ovules being, as he believes, nothing more than obstructed glands, that, having described the contents of the one, he does not deem it necessary to describe the other. He looks upon the formation of the mucous plug (*bouchon gélatineux*) of pregnancy, as the chief function of the cervical glands, and he describes the contents of the ovules of Naboth, as composed of—1. Epithelial cells, furnished with vibratile cilia in variable number; 2. Of ovoid globules having the appearance of fibro-plastic cells, but being somewhat smaller; 3. Of voluminous globules, similar to the granular globules (*globules granuleux*) of inflammation; and 4. Of small globules possessing an uneven outline, composed of a homogeneous mass wanting a special cell-wall. An examination of the mucus of the cervix and the contents of an ovule of Naboth, would have shown the dissimilarity of their constitution. I shall hereafter have to point out my reasons for believing that the so-called ovules have no connection whatever with the cervical mucous follicles.

Opinions of previous Authors.—Sir Charles Clarke, though he recognized to some extent the discharge of mucus from the cervix in its diseased conditions, considered that the glands of the cervix in the healthy state only acted during pregnancy. The following extract will show his opinion upon this subject:—

“The mucus secreted by these glands (the glands of the cervical canal) contains a smaller proportion of water than any other mucus in the body, approaching nearer to the nature of a solid, than to that of a fluid body: it is semi-transparent, and possessed of a great degree of tenacity: it adheres to the fingers like bird-lime; but the attraction of cohesion between its parts is so strong, that it may be generally drawn away entire from any body to which it has adhered. If the uterus of a pregnant woman is examined after death, this mucus may be drawn out of the orifices of the glands which secrete it. These glands, in a state of health, perform the office of secretion in pregnancy only; or, if at any other time, the

matter secreted is of a very different kind, so resembling common mucus as not to be distinguished from it.

"It is probable that the secretion of this viscid substance is confined to the commencement of the state of pregnancy; for if the body of a woman in the third month of utero-gestation is examined after death, the quantity of mucus filling the cervix uteri will be found to be quite as considerable as at the close of pregnancy. The intention of this mucus has been supposed to be, to prevent the escape of the ovum in its early state; and that when it has answered this purpose, the secretion ceases; but it is probable that it has some other use, at present not understood."

"It is known that the uterus prepares for the reception of the ovum before the ovum reaches its cavity, by the formation of the decidua; the cervix uteri also performs the secretion of this viscid substance immediately after impregnation has taken place."

Dr. Ashwell, very properly lays it down that, "although the vagina is the common outlet for all leucorrhœal discharges, it must not be forgotten that these differ much from each other, being furnished by parts of different structure and vascularity, whose healthy secretions are far from identical. A precise knowledge of these differences, will not only assist us in the diagnosis, but will also render our treatment more efficient."

Dr. Ashwell next proceeds with a description of the secretion of the different portions of the utero-vaginal canal in the following terms:—

"The mucus naturally secreted by these various parts, although not entirely the same, does not differ in any of its essential properties from mucus furnished by similar membranes in other parts of the body. It consists of albumen and soda, and in transparency, color, and viscosity, it closely resembles the white of an egg in its natural state.

"*The mucus secreted by the lining membranes of the uterus and Fallopian tubes,* is correctly characterized by the above description. Its purpose is such a degree of lubrication of the sides of the tubes, and of the opposing surfaces of the uterine cavity, as shall prevent their adhesion. It need scarcely be added, that a very small quantity is sufficient, and that, with the exception of the period of pregnancy, when the decidua covers the membrane, its secretion must be constant.

"*The mucus furnished by the lining membrane of the vagina* is more abundant in quantity, and less viscid than the uterine mucus. This fact is readily proved by examination under procidentia. If the finger be merely introduced into the vagina and withdrawn, it will be covered by a thin mucus only; but if it be carried, as it often must, through the os into the interior of the uterus, the adherent mucus will be found much more ropy and tenacious; generally, indeed, it may be considerably drawn out without breaking.

"*The mucus furnished by the lacunæ of the vestibulum*, or that part of the vagina external to the hymen, is probably slightly more tenacious than the vaginal secretion, and is said to exhale a peculiar odor. Whether it possesses this latter property independently of pregnancy or morbid action, in a higher degree than the mucus furnished by other parts, admits, I think, of doubt.

"*The secretion from the glands of the interior of the cervix uteri* is not often found in common leucorrhœa. I had lately an opportunity of examining these glands and their product, in a patient who died in early pregnancy. These glands themselves were numerous, and clearly discernible, and the mucus easily drawn out entire and unbroken."

I quote these opinions of Dr. Ashwell, because he is the principal systematic writer upon leucorrhœa, and his work is extensively in the hands of practitioners. It will be seen that our opinions differ considerably respecting the nature and sources of the utero-vaginal secretions. The difference between the vaginal and uterine mucus, is not merely one of relative viscosity or tenacity. The vaginal secretion is epithelial, the uterine secretion consists of mucus-corpuscles. As regards the quantity of the cervical secretion, he has followed the error of Sir Charles Clarke, in supposing it to be scanty except during pregnancy, and in believing it to be a rare constituent of common leucorrhœa. I shall have to show hereafter, that, in the most common form of leucorrhœa, the discharge consists almost entirely of mucus secreted by the glands of the interior of the cervix uteri. As regards the source of the peculiar odor referred to, I have stated my belief that it is due to the secretion of the fat glands of the vulva, which chemists have found to contain butyric acid.

Another uterine pathologist, Dr. Henry Bennet, makes no attempt

at distinction between the secretions of the different parts of the utero-vaginal canal. He merely states :—

"The mucous follicles of the vulva, vagina, and uterine neck, when in a perfectly physiological state, free from all congestion or morbid influence, secrete in more or less abundance a slightly glutinous transparent fluid, of the same description as that which is secreted by mucous follicles on other parts of the body. This, the natural mucous secretion of the female sexual organs, is best observed for a day or two after menstruation in the healthy female, the vulva and vagina being then, generally speaking, frequently lubricated by a mucus of this description. This mucous secretion is also increased under the influence of uterine orgasm. In the healthy state, it is never sufficiently abundant to constitute a discharge, merely lying on the parts where it is secreted, and moistening them."

Dr. Whitehead, though he is in some points most accurate respecting the nature and origin of the leucorrhœal secretions, makes little or no mention of the healthy secretion from the cervix uteri. He appears to have considered the secretions of the vagina as of far greater importance. He has particularly insisted upon the acidity of the vaginal mucus, the whitening of the mucus by the coagulation of its albumen, its less amount of viscosity as compared with other mucus, and its power of preserving the menstrual secretion in a fluid state. Dr. Whitehead states, incidentally, that it is "extremely rare" for the uterine mucus "to be produced in unusual abundance." When describing the cavity of the unimpregnated uterus, he observes : "It is smooth, and contains nothing but a fine *halitus*, the product of its lining membrane, except at its *cervix*, which, under certain circumstances, is occupied by a small quantity of glairy mucus, the peculiar secretion of this part of the organ."

These discrepancies of opinion are sufficiently obvious: it appears to me that nothing has contributed to perpetuate them so much as the different chemical conditions of the secretions of the vagina and the cervical canal. However long the alkaline cervical secretion remains within the cervical canal, and removed from contact with the acid of the vagina, it is generally transparent or semi-transparent. It evidently owes its transparency to the alkali it contains. But the acid vaginal secretion cannot remain upon the surface of the vagina without becoming curdled and opaque. This

as evidently depends on the vaginal acid. The acid of the vaginal mucus has, however, the same effect on the clear viscid mucous of the cervix whenever it comes in contact with it, an effect which may be imitated out of the body. On the addition of a little weak acetic acid, the thick viscid mucus of the cervix becomes in a short time changed, so as to resemble the curdy mucus of the vagina. It loses its viscosity and transparency altogether. The importance of this fact has not been perceived in the examinations of the utero-vaginal discharges. As the proper mucus of the vagina is, when in any quantity, curdy or creamy in its appearance, it has been thought that, whenever a discharge of this kind has been found in the vagina, it must have been formed there. It is so unlike the transparent tenacious mucus of the cervix, that the cervical canal has not been suspected as the source of such discharges. The truth is, however, that whenever any of the clear cervical mucus passes into the vagina, the acid secretion assimilates it to the vaginal secretion so exactly, that without the microscope it would be impossible to perceive any difference between this and the strictly vaginal mucus. Hence a fertile source of mistake, and a tendency to attribute the cervical secretion, when found in the vagina, to the vagina itself. In no other way can I explain the indistinct and uncertain ideas which have been formed respecting the cervical and vaginal discharges. A minute examination was especially necessary, as it is only from something like an accurate knowledge of the healthy secretions, that we can possibly pass to the study of leucorrhœa and its pathology.

CHAPTER IV.

THE DIFFERENT FORMS OF LEUCORRHœA.

OBJECTIONS may possibly be raised to some of the anatomical and physiological views which have been brought forward in the preceding pages; and it must be evident that many points connected with the intimate anatomy of the vagina and the os and cervix uteri still remain for investigation; but I trust enough has been established to furnish the foundations for a more correct Pathology of Leucorrhœa than has hitherto existed. It is obvious that this was impossible without a microscopical examination of the tissues concerned, and of the secretions of these tissues in their physiological and pathological conditions. Nor can it be denied that, heretofore, whenever the lower part of the uterus has been minutely dissected, it has been with a view to ascertain the presence or absence of muscular fibre, or the distribution of the nerves and bloodvessels, rather than to learn the organization of the mucous surface of this part of the organs of generation.

If, as I have previously shown, great discrepancy of opinion has prevailed respecting the sources of the healthy secretions of the vagina and canal of the cervix uteri, there has been still greater confusion as regards the seat and constitution of the morbid utero-vaginal discharges. No one had inquired minutely into the nature of these discharges, so that current opinions upon the subject have had no better foundation than guessing and hypothesis. Let any one who doubts the correctness of what is here advanced, examine for himself the doctrines hitherto taught respecting leucorrhœa, and he will find that some refer to the vulvo-vaginal glands as the chief seat of leucorrhœal discharge; that others refer to the vagina as a great follicular tract from which the principal amount of these discharges proceeds; that others again look to the cavity of the fundus uteri and its mucous lining as the great source of uterine mucous secretions. As regards the causes of these discharges, some have

limited their attention to the sexual organs, while others have looked to the conditions of remote parts of the body, for the explanation of leucorrhœal disorders. It would indeed be easy to fill a volume with the discordant accounts which, in the absence of a knowledge of the minute anatomy of the parts involved, have been given of the nature and source of leucorrhœal discharges. One or two authors only have referred to the canal of the cervix uteri as the principal seat of mischief in leucorrhœa; but their teachings have been uncertain and without proof, since no one, so far as I am aware, ever made a positive and minute examination into the subject, or recognized to the full extent the glandular organization of the cervical canal. No pathologist has hitherto formed anything like a just appreciation of the parts borne respectively by the vagina and the os and cervix uteri in the production of leucorrhœal discharges. Effects have been constantly mistaken for causes, and secondary phenomena have received the importance due to those which are primary, while in practice the most important structures have frequently escaped attention altogether. The consequence has been, that some have recommended the most violent measures of treatment, while others have rejected all remedial measures except the most simple and inert. Meanwhile, this department of medicine has witnessed a contest which for virulence and acrimony has seldom been equalled in the history of the profession.

All pathology has its basis in physiology. In the various departments of medicine, the only way of reconciling differences of opinion is by investigation. The demonstration of two very differently organized surfaces in the vagina, and in the canal of the cervix uteri, with the existence of two very distinct forms of secretion, naturally lead us to the consideration of two principal forms of leucorrhœa. But at this point it may be well to revert for a moment to the special differences which exist between the vagina and the cervical canal. The lining membrane of the vagina approaches in organization to the skin; it is covered by a thick layer of scaly epithelium; it contains in the greater part of its surface few if any mucous follicles or glands; its secretion is acid, consisting entirely of plasma and epithelium, and the chief object of the secretion is the lubrication of the surface upon which it is formed. On the other hand, the lining of the canal of the cervix is a true mucous membrane; it is covered in great part by cylinder epithelium; it

abounds with immense numbers of mucous follicles having a special arrangement; it pours forth a true mucous secretion, alkaline in character, and consisting of mucus-corpuscles and plasma, with little or no epithelium; and this secretion has special uses to perform in the unimpregnated state, and in pregnancy and parturition. Leucorrhœa admits of a similar division. The first and the most frequent and important is the Mucous variety, consisting chiefly of mucus-corpuscles and plasma, and secreted chiefly by the follicular canal of the cervix. The second is the Epithelial variety, in which the discharge is Vaginal, or is secreted by the vaginal portion of the os and cervix, and consists for the most part of scaly epithelium and its *débris*. These two varieties may of course exist in various degrees of combination; sometimes the one and sometimes the other preponderates, or is the original affection; but the chief importance must be given to cervical or mucous leucorrhœa, as being the most obstinate and common. I pass by at present altogether those discharges limited to the ostium *vaginæ*, as these, when they occur, which is seldom, are easy of diagnosis and cure. I have already referred to the antithesis of function which exists between the cervical canal, and the cavity of the fundus uteri; the one secreting mucus periodically, the other producing the catamenial secretion. It is impossible not to be struck with certain points of comparison and contrast between some of the disorders of the fundus uteri and cervical leucorrhœa. In certain cases of menorrhagia, for instance, the periodical sanguineous discharge is converted into a constant colored discharge; while in severe cases of leucorrhœa the periodical white mucous discharge is rendered permanent. I shall have hereafter to show that the relations between leucorrhœa and the catamenial function in health and disease are very interesting and important.

Cervical or Mucous Leucorrhœa.—In cervical or mucous leucorrhœa, the glandular portion of the canal of the cervix uteri is the chief source of the discharge. This form of leucorrhœa is, when simple and uncomplicated, the result of a morbid activity of the glandular cervix. A follicular organ which should only take on an active condition at certain intervals, becomes from a variety of causes, constantly engaged in profuse secretion. Instead of the discharge of the plug of mucus at the catamenial period, an incessant discharge is set up. This discharge, it cannot be too often

repeated, is a special glandular secretion, elaborated by the glands of the canal of the cervix uteri. In the first instance the leucorrhœal discharge consists of nothing more than an unusual quantity of the elements found in the healthy mucus of the cervical canal. Quantities of mucus-corpuscles and oily particles, with particles of epithelium entangled in the viscid alkaline plasma which gives the mucus its clearness and consistence, are found. The clear mucus is seen at the os uteri, sometimes adhering to the os itself, at others extending through the vagina, and presenting at the os externum in the form of a string, and also lying upon the walls of the vagina, in the curdy or creamy state to which it is reduced by the action of the vaginal acid. The presence of oily matter in the discharge from the cervix is constant, and so is the presence of occasional particles of scaly epithelium, which, as I have before remarked, appears to ascend from the vaginal portion of the os and cervix. I should state that, in obtaining matter from the cervix for microscopical examination, I have always used a bivalve speculum, free from grease or oil, dilating the os uteri as much as possible by the expansion of the valves, in order to get the secretion of the cervical canal without the admixture of any vaginal mucus. In making an examination in a case of cervical leucorrhœa of recent origin, when the disorder consists merely of a hyper-secretion of the mucous follicles, without any manifest lesion of structure, the cervical discharge hanging at the os uteri, or adhering to the vaginal portion of the os uteri, is almost always viscid and transparent. It may be drawn out with the forceps as a long tenacious string of the utmost clearness. The chief exception is in cases of pregnancy, where, from the highly acid condition of the vaginal mucus, the lower part of the plug of mucus is whitened and curded before its exit from the os uteri. In ordinary cases, when the secretion is very abundant, the plug issuing from the os uteri is gradually extended through the vagina without losing its cohesion, and hangs at the ostium vaginæ. Sometimes this plug or rope is of considerable thickness; it is always whitened from the curding of its outer particles by the vaginal acid, and some portions of it are constantly wearing off and in course of deposit as curdy matter upon the walls of the vagina. This whitenedropy string is not so tenacious as the clear mucus of the cervix before its admixture with the vaginal acid. When drawn out, it divides more readily than the transparent mucus. When the secretion is

more moderate, or when the vaginal acid is more abundant than usual, the cervical discharge does not extend into the vagina in the form of a string, but is worn away and curdled at the os uteri or the upper part of the vagina, so that it lies upon the vaginal wall as curdy or creamy matter, and is not distinguishable by the eye from vaginal mucus itself. Many descriptions and comparisons of the different discharges in leucorrhœa have been written. It appears to me that of the two principal forms of the discharge, the secretion from the canal of the cervix uteri may be compared to soft or fluid soap. It seems as if the alkali of the discharge combined with the fatty and albuminous elements, to form a saponaceous compound. When this discharge passes into the vagina and becomes acted on by the vaginal acid, it curdles, just as when soapy matter is mixed with an acid solution, and probably from a similar cause. The acid vaginal secretion, mixed with the alkaline secretion from the cervix, resembles milk, or thin cream, in its outward appearance, and is composed of acid and albuminous matter. In very severe cases, the mucus of the cervix becomes mixed with pus-corpuscles and the discharge is rendered muco-purulent in character; or the surface of the canal and the os uteri becomes so irritable as to bleed on the slightest irritation, blood-corpuscles being added as another element of the discharge. When the quantity of blood mixed with the discharge is considerable, or when it is speedily evacuated from the vagina, it resembles the menstrual secretion in color; but when it is small in quantity and discharged slowly, it gives a greenish or sometimes a brownish tint to the discharge. Occasionally, instances are seen in which the exudation of blood from the cervix is so constant as to mask the leucorrhœal symptoms to a considerable extent, and without a very careful examination such cases might be mistaken for menorrhagia. The quantity of mucus secreted by the cervix in severe and long-continued cases of simple leucorrhœa, is often sufficient to prove a serious drain to the constitution, and to set up functional or more serious disorders in different parts of the body. The glandular cervix becomes in some of these cases so excitable that any unusual stimulus provokes a sudden and copious flow of mucus. The relation of mental emotion becomes almost as intimate as the connection between the mind and the lachrymal glands. Any violent mental disturbance is in such cases followed by a copious and sudden discharge of mucus through the os uteri

into the vagina. In some cases of cervical leucorrhœa numbers of caudate corpuscles are found which appear to be altered cylinder epithelium, mixed with mucus-corpuscles.

In other cases of cervical leucorrhœa, the secretion is so profuse and watery that the traces of viscosity are nearly lost. Instead of the consistent plasma which is one of the common elements of the cervical discharge, a watery serum is poured out in considerable quantity. This excessive secretion, when long-continued, is a source not only of inconvenience, but of great debility. In some cases, the quantity of mucous secretion is so considerable, and the action of the vaginal acid so marked, that the secretion escapes from the ostium vaginæ in stringy or rounded masses of considerable size. Patients suffering from cervical leucorrhœa to a severe extent may be weakened by the quantity of serous or mucous discharge; they may become hectic from purulent secretion and absorption; or they may be rendered anaemic by the sanguineous complication. In the worst cases, the discharges, in their physical appearances, may resemble the discharges in carcinoma; but I shall have at a future time to refer to the diagnosis between these maladies.

Vaginal or Epithelial Leucorrhœa, and Desquamation of the Vagina.—In Vaginal or Epithelial Leucorrhœa, the seat of the discharge is in the muco-cutaneous lining of the vagina, and the portion of this membrane reflected over the external surface of the cervix to the margin of the os uteri. In strictly vaginal leucorrhœa, there may be no discharge whatever issuing from the canal of the cervix, and in some cases the secretion of the cervix seems almost suspended, the os uteri appearing drier than natural, and no mucus being visible between the labia uteri. In others, the cervical glands are excited by the condition of the vagina, and secrete copiously a mixed epithelial and mucous leucorrhœa, from the union of the two kinds of discharge being the result. The discharge in vaginal leucorrhœa may arise chiefly, either from the lower portion of the vaginal membrane, or from that part which is reflected over the cervix; but in severe cases the whole surface of the vagina is involved. The secretion in these cases generally consists entirely of epithelium, in every possible phase of development, mixed with acid mucous plasma. A portion of the secretion diluted with a little water, and placed under the microscope, is seen to consist of myriads of epithelial particles

in the form of mere nuclei, young scales which have not reached their full development, and perfect scales. If the case be acute, there are no old and broken scales, such as are found in the healthy secretion, the epithelium being separated too rapidly in the formation and flow of the discharge to admit of their coming to maturity and wearing away in the vagina. In mild cases, when the separation is more slow, ripe and well-worn scales are sometimes present. When the vaginal form of leucorrhœa becomes very severe, the villi become affected, and not only is epithelium separated with extraordinary rapidity, but pus is formed upon the irritable sub-epithelial or villous surface, which when mixed with the epithelial matter can hardly be distinguished from the mucus-corpuscles of the cervix mixed with scaly epithelium. The state of the vagina as seen by the eye, will, however, remove all doubt as to the nature of the discharge in these cases. A further complication of vaginal leucorrhœa may occur, as when portions of the vaginal surface are so abraded that blood-globules escape and mix with the other constituents of vaginal discharge. The vaginal secretions now described are those most commonly found in vaginal or epithelial leucorrhœa ; but there is another form of vaginal discharge which deserves consideration. In that already mentioned, the secretion consists of epithelial matter thrown off from the surface in such a state of separation that the scales are in a confused mass, the fluid portion being exuded from the vessels of the villi or papillæ below the epithelium. But in the second form of epithelial disorder, to which I now refer, the epithelium is thrown off in large shreds or pieces, in which the pavement-like arrangement of the scales is perfectly preserved. These laminæ frequently have upon them marks of the rugæ of the vagina, and somewhat resemble the cuticle in cases of acute desquamation of the surface of the body. The under surfaces of these masses are also rough from the indentations of the vaginal papillæ. Sometimes, on making a specular examination in these cases, the whole surface of the vagina is seen covered with a white coating, which may be removed by a forceps in membranous pieces of considerable extent and thickness. This affection may be attended with a slight discharge from the subepithelial surface ; but in many cases the vagina does not contain more secretion than usual, or it may be unnaturally dry. In all epithelial affections of the vagina, the discharge is acid ; but

the acidity is particularly marked in this—the membranous form of leucorrhœa, as it may be termed. Some of the instances in which I have seen this affection in its most marked form, have been in cases of pregnancy. I have sometimes had patients bring me a mass as large as a walnut, consisting of pieces of the epithelial coat of the vagina rolled up like paper ; or I have seen a tumblerful of water rendered perfectly thick with the quantity of shreds removed from the vagina by a single injection.

In these cases the simple shedding of the epithelium in great abundance, and the desquamation of the epithelium in masses, might be called Epithelial Vaginitis, while the purulent form of the disorder in which the villi are affected, might be called Villous Vaginitis.

I have thus been led to look to the mucous glands of the cervix uteri, and to the vagina, as the chief seats of disorder in leucorrhœa. I have not found the mucous follicles at the entrance of the vagina a frequent source of leucorrhœa in adults ; but the leucorrhœa met with in young children is principally derived from these glands, and consists of scaly epithelium and mucus-corpuscles. As regards the supposed cervical catarrh from the cavity of the fundus uteri, about which many authors have written, I have seen no cases in which there was any evidence that the sources of the discharge were above the canal of the cervix. Irritation of the mucous membrane of the fundus uteri seems to be attended by sanguineous and watery rather than mucous discharges. Menorrhagia appears to play the same part with reference to the fundus uteri as leucorrhœa does with regard to the cervical canal. In prolapsus uteri, where the cervix is exposed to irritation, profuse cervical leucorrhœa is the result. While in cases of inversion of the uterus, when the mucous membrane of the cavity of the fundus is exposed to irritation, constant menorrhagia occurs.

The following are the elements found in the discharges in vaginal or epithelial leucorrhœa of different degrees of severity :—

1. ACID PLASMA.
2. SCALY EPITHELIUM.
3. PUS-CORPUSCLES.
4. BLOOD-GLOBULES.
5. FATTY MATTER.

The following are the elements found in the different forms of cervical or mucous leucorrhœa :—

1. ALKALINE PLASMA.
2. MUCUS-CORPUSCLES.
3. ALTERED CYLINDER EPITHELIUM.
4. PUS-CORPUSCLES.
5. BLOOD-GLOBULES.
6. FATTY PARTICLES.

At the commencement of the present inquiry, a great number of microscopical examinations of the vaginal and uterine discharges in leucorrhœa were made. Indeed, the leucorrhœal secretions occupied my attention for some time before I turned to the minute anatomy of the os and cervix uteri as a means of explaining some of the difficulties in the way of understanding the discharges themselves. In these examinations I was chiefly indebted to my friend and colleague, Dr. Handfield Jones, whose skill and accuracy as a microscopical observer are well known. I at first thought the microscope would certainly show some difference between the clear, viscid secretion found issuing from the canal of the cervix and the curdy discharge sometimes found upon the os uteri, but more frequently upon the walls of the vagina. It soon appeared, however, as the rule, that the clear viscid mucus escaping from the os uteri consisted of plasma and mucus-corpuscles; and the opaque mucus found upon the walls of the vagina, of scaly epithelium and plasma: but there were many exceptions to this, of cases in which the clear mucus of the vagina contained nothing but epithelium, and the curdy mucus nothing but mucus-corpuscles. It required numerous examinations to reconcile these difficulties, and it was only after a good many trials that it became evident the clearness or opacity, viscosity or want of cohesion, depended entirely upon the acidity or alkalinity of the secretion, the presence or absence of epithelium or mucus-corpuscles making no difference whatever in the physical characters of the leucorrhœal fluid. Whenever the cervical mucus is acted upon by the vaginal acid, it becomes white and curdy; while, if from any cause the acidity of the vagina is diminished in quantity, the epithelial discharge remains transparent. In obtaining specimens, every care was taken to obtain the secretion free from any foreign admixture. When injections were being used, the patients were always directed not to inject on the days on

which the specimens of secretions were obtained. I ought to mention that patients were never examined merely to obtain specimens of secretion, but only when it was proper to examine for purposes of treatment, or to ascertain the effect of the remedies employed. It has been mentioned to me as an objection, that the busy practitioner cannot constantly subject the discharges in cases of leucorrhœa to microscopical examination, and that in consequence the value of such investigations as the present must be limited. But such an examination is by no means necessary. Having, as I believe, traced leucorrhœal discharges, generally, to their principal sources by the aid of the microscope, it is easy to pronounce, without microscopical examination in ordinary cases, whether the discharge be vaginal or cervical. The transparent gelatinous-looking discharge from the cervical canal, and the same discharge rendered white and soapy, or coagulated into masses by the vaginal acid, is easily distinguished from the white, milky, or creamy discharge from the vagina. The only mistake likely to occur is when the cervical discharge is so curded and broken down in the vagina by the action of the acid as to resemble the vaginal discharge. But these points are readily determined by an examination of the os and cervix uteri and the vagina. The flaky discharge in epithelial disorganization is unmistakable. In many cases it is quite possible to ascertain the seat and nature of the discharge, by the patient's description. The following notes of cases will show the kind of evidence upon which the preceding account of the epithelial and mucous varieties of leucorrhœa was founded.

CASE IV.—*Microscopical Examination of Discharge in Profuse Mucous Leucorrhœa.*—Jan. 1852. A specimen of discharge was taken from B——M——, a woman suffering from profuse leucorrhœa of long standing. The discharge was so profuse, consisting both of fluid and tenacious matter, that on introducing the bivalve speculum it reached up more than one-half of the length of the lower blade. The morbid secretion was evidently proceeding from within the os uteri, the orifice of which was occupied with a thick, semi-opaque plug. When this was seized with the forceps, it was so tenacious, that a large mass of the discharge which lay in the vagina came away with it. Upon examination with the microscope, the mass was found to consist almost entirely of myriads of mucus-

corpuscles and viscid alkaline plasma. Few traces of epithelium were detected. Such was the viscosity of the mucus that the corpuscles were visibly stretched and elongated by the compression of the fluid by the pieces of glass between which it was examined. The fluid portion of the discharge consisted of the same elements, with the exception that a serous fluid, coagulable by heat, took the place of the viscid plasma. Both were alkaline, and both were secreted by the canal of the cervix uteri.

FIG. 19.



Mucus-corpuscles, a few epithelial particles, and oil-granules,
in mucous or cervical leucorrhœa. 220 diameters.

CASE V.—*Microscopical Examination of Discharge in Simple Epithelial Leucorrhœa.*—Dec. 1851. E____ P____, out-patient, unmarried, aged eighteen. Has suffered for some months from distressing pain in the back when in the upright position. The cata-menia have been scanty since their first appearance, at the age of fifteen, seldom flowing for more than one day at each period. The whole of the external surface of the os and cervix uteri, and the upper part of the vagina, was intensely red. These parts were covered with white curdy secretion, but no discharge whatever was issuing from the canal of the cervix. The hymen was absent, but there was no suspicion of gonorrhœa.

A portion of this secretion, on being examined by the microscope, was found to consist of little else than multitudes of epithe-

lial scales, with a few mucus- or pus-corpuscles, exhibiting their nuclei with unusual distinctness. The secretion was slightly acid.

Dec. 16th.—The condition of the os uteri had greatly improved up to this time. A portion of the discharge was again collected from the surface of the os.

Under the microscope, the secretion consisted almost solely of well-formed epithelial scales, which appeared well worn and as if they had not thrown off very early. The scales floated in a transparent fluid, which also contained a few mucus-globules, that had no doubt escaped from the cervical canal. When tested, the secretion was found to be acid.

FIG. 20.



Epithelium in all stages of development, in epithelial or vaginal leucorrhœa. 220 diameters.

CASE VI.—*Microscopical Examination of Discharges in Vaginal Leucorrhœa, or Epithelial Vaginitis, with Epithelial Desquamation.*—Nov. 1851. A—S—, married, aged twenty-nine, of plethoric habit, has never been pregnant. Complained of pain in the back, bearing down, and pain and heat under the pubis. There was pain and heat in micturition, with frequent desire to void urine. She had suffered for several years from white discharge, and says that flakes of something like wet paper have constantly passed.

On making an examination, the walls of the vagina fell in between the blades of the speculum, showing the existence of great debility of the muscular tissue of the vagina; and the os uteri was

very low down in the passage. The canal was covered with curdy discharge and large pieces of epithelium, in masses of an inch or more in length, which could be taken entire from the vaginal surface. The os uteri was quite free from discharge, and small and nipple-shaped, as is so frequently found to be the case in sterile women, where the uterine development is imperfect. The masses of epithelium were seen by the naked eye to bear the marks of the vaginal rugæ. The free surface was smooth; the other, which had covered the papillæ, rough and uneven. Examined by the microscope, the whole consisted of flakes of scaly epithelium arranged in the tessellated form.

CASE VII.—*Microscopical Examination of Discharge in Mixed Mucous and Epithelial Leucorrhœa.*—Oct. 1852. M—H—, out-patient; married several years; aged twenty-nine; never pregnant. When she first applied, there was complete denudation of the os uteri. At the time of the present observations, the surface of the os had become smooth and healthy in parts from the formation of epithelium, but a considerable quantity of cervical discharge still issued from the os uteri.

Nov. 24th, 1852.—A portion of secretion was taken from the interior of the cervix. A gelatinous string was drawn out from the aperture of the os, clear, transparent, and glutinous, and placed in a glass tube for examination. Under the microscope, the secretion was found to consist chiefly of an immense multitude of mucus-particles entangled in tenacious plasma.

Dec. 1st.—The os uteri was further advanced towards the healthy condition. Some of the discharge was now taken, not from the cervix, but from the surface of the os. It was decidedly acid. It contained heaps of epithelial scales and some mucus-globules, immature and feebly formed. In this specimen, homogeneous plasma was very abundant.

CASE VIII.—*Microscopical Examination of Discharge in Mixed Mucous and Epithelial Leucorrhœa.*—R—G—, married; aged twenty-three; had been an in-patient in Victoria ward, under my care. On her admission she was suffering from prolapsus uteri and excessive purulent leucorrhœa. At the time she became an out-patient the prolapsus had been remedied to a great extent by

rest and astringents, but considerable leucorrhœal discharge still continued. In this case, the catamenia had been profuse and frequent, the ordinary interval seldom being preserved. When she was in the hospital, mucus and pus were plentifully secreted from the external surface of the os and cervix, and the glutinous discharge from the cavity of the cervix was constant and profuse.

Nov. 24th, 1851.—There was a glairy discharge seen issuing from the cavity of the cervix, and an abundance of opaque curdy matter covered the external surface of the os uteri. A portion of the glairy mucus was taken for examination. The mucous membrane underneath the discharge was deeply red, bleeding upon being touched. The secretion was found to be decidedly alkaline.

When examined by the microscope, the secretion was found to contain multitudes of mucus- or pus-globules, with a few scaly particles, and some cells in progress of development towards scales, with numerous blood-corpuscles. These were all enveloped in a homogeneous plasma.

Dec. 1st.—Some of the secretion was taken from the ostium vagina for examination. She had improved since the last report, but the discharge was still considerable. The secretion at the outlet was moist, starchy in appearance, but not adhesive, and looking very much like dissolved curd. It was feebly acid.

This secretion was found to contain quantities of epithelial scales, of which the greater number were perfectly formed and mature, and also mucus- or pus-globules, all entangled in a homogeneous tenacious plasma. The mucus- or pus-globules had evidently flowed down from the cervix uteri.

A specimen of the leucorrhœal secretion was at the same time taken from the surface of the os uteri. It was much the same in appearance as that taken from the outlet, but somewhat thicker and more creamy. There was little discharge issuing from the cervix at this time. The reaction was feebly acid. Upon examination it was found to contain a great quantity of epithelial scales, with mucus- or pus-corpuscles, probably the latter.

Dec. 16th.—At this date there was little secretion upon the surface of the os and cervix, but a semi-transparent glutinous secretion issuing from the os uteri. The secretion contained, besides some blood-globules, myriads of mucus-globules, with a very few epithe-

lial particles in various stages of formation. These were all involved in a very tenacious and perfectly homogeneous fluid.

CASE IX.—*Microscopical Examination of Discharge in severe Muco-purulent and Sanguineous Leucorrhœa.*—E—B—, Victoria ward, suffering on admission, August, 1851, from procidentia uteri, attended by profuse puriform discharge. The procidentia was in a short time reduced, but the leucorrhœal discharge proved extremely obstinate. The whole of the os and cervix, externally and internally, was denuded of epithelium, and secreted large quantities of pus and mucus daily.

Nov. 23d.—A specimen of the discharge was taken two or three days after the completion of a catamenial period, in which the flow had been profuse and prolonged. It consisted of a thick, adhesive string of secretion, which was hanging from the os uteri, and was taken from thence by a pair of broad-pointed forceps. There was no appearance of blood upon the surface from which the secretion was taken; but after its removal the surface bled upon being touched lightly by the forceps. The secretion, when removed, was decidedly alkaline; it was very tenacious, and contained multitudes of mucus- or pus-globules—probably the latter—crowded together in a viscous, homogeneous fluid, together with numerous oil-drops, and some traces of scaly epithelium, with several distinct groups of blood-globules. The globules of pus or mucus were well formed, but had for the most part no very marked envelope. They were full of granulous contents, which obscured their nuclei, so that they were only faintly seen until acetic acid was applied, when they became distinct.

Dec. 17th.—A similar specimen to the above was taken in the same manner from the interior of the os uteri, the patulous os uteri being dilated by the bivalve speculum. At this time the patient was suffering from irritative fever, which she had done to some extent ever since her admission, at intervals of two or three weeks, the fever being produced no doubt by the absorption of the *liquor puris*, and generally terminating in a smart attack of diarrhoea. The discharge was very profuse, extending in a stream from the interior of the cervix to the ostium vaginalæ.

The secretion consisted of a tenacious, viscid, and transparent fluid, entangling multitudes of pus- or mucus-globules. Numbers

of vibriones were present in this specimen of discharge. Bichloride of mercury and nitric acid coagulated the secretion, and rendered it white and opaque. This tended to show that the fluid part of the secretion was albuminous, or *liquor puris*; but on microscopic examination of the coagulated secretion, it was found that the globules were most affected, and that there was no great amount of granular coagulum. The tenacious nature of the fluid was in favor of its containing *liquor muci* as well as *liquor puris*. There could be no doubt the secretion really consisted of a mixture of pus and mucus, such as might truly be termed muco-pus.

In this case the alkalinity depended upon two causes, the presence of pus, and the excessive cervical secretion. Though there was a great extent of disease of the cervix uteri, the vagina was little affected, as shown by the scanty amount of epithelial admixture. There were no epithelial scales in the discharge taken from the os uteri, because this part was entirely denuded, and instead of forming epithelium, it was secreting pus in abundance.

FIG. 21.



Mucus- and pus-corpuscles, epithelial particles, and blood disks, from mucous or cervical leucorrhœa. 2.0 diameters.

CASE X.—*Microscopical Examination of Discharge in Profuse Leucorrhœa during Pregnancy; the Discharge being a Mixture of Serum, Pus, Blood, and Mucus-Corpuscles.*—April, 1852. The subject of this case was in the sixth month of pregnancy. Mis-carriages had frequently occurred. She had formerly suffered from

purulent leucorrhœa, which had been relieved by treatment. During the first three months of the present pregnancy, she had enjoyed tolerable health. After this time, profuse discharges from the vagina occurred; sometimes pale and watery; at others she passed considerable quantities of blood. There was some apprehension lest she might be suffering from malignant disease. Digital examinations were attended by severe pain, and followed by discharges of blood. To the touch, the os uteri was found hard, irregular, lobulated, and extremely sensitive. Examined by the speculum, the os was seen to be deeply fissured, and the posterior lip was excavated by ulceration, which extended into the cervical cavity. This patient had been profusely treated by potassa fusa some time previously to the occurrence of pregnancy, and it appeared as though the cicatrices of the deep cauterizations had given way under the development of the os and cervix uteri during pregnancy. About a tablespoonful of the discharge was collected for microscopical examination. It was so deeply tinged with blood as to render the term leucorrhœal inapplicable; yet there could be little doubt that the glandular cervix had been the original seat of mischief.

The discharge consisted of an abundance of serum—all traces of viscosity being lost—which contained great quantities of blood-globules, heaps of mucus- and pus-corpuscles, and multitudes of epithelial scales. During the last three months she had lost quarts of this fluid, and had frequently been obliged to use a dozen napkins a day. Notwithstanding the profuseness of the discharge, it was as distinctly alkaline as the viscid mucus of the cervix. The whole secretion was intensely albuminous, coagulating almost entirely by heat. Great emaciation existed. The alkaline discharge had excoriated the ostium vaginalæ, which was hot and painful, and shedding epithelial matter in great abundance.

Early in May, this patient fell into premature labor, and, after considerable suffering, she was delivered of a still-born foetus. The day after her delivery, I obtained some of the discharge for microscopical examination. The secretion, now mixed with the lochia, still continued fluid and profuse. It was found to consist of myriads of blood-corpuscles, mixed with scaly epithelium and mucus- and pus-corpuscles, all contained in a sero-albuminous fluid.

I have thus given at length the results of the microscopical ex-

amination of the discharges in leucorrhœa. This examination, taken together with the microscopical examination of the utero-vaginal tissues, appears to fix the sources of the morbid secretions, and to decide what are vaginal and what are uterine. To show the neces-

FIG. 22.



Leucorrhœal and lochial discharge, consisting of blood-globules, mucus-corpuscles, and pus-corpuscles, the former in great abundance, mixed with scaly epithelium. 220 diameters.

sity of such an examination, I venture to quote in detail the opinions of some of the most recent authors respecting the nature and sources of leucorrhœal discharges, such opinions being entirely drawn from the appearances presented by the discharges to the naked eye. The contradiction and confusion, which will be evident, confirm the observations made at the commencement of the present chapter.

Sir Charles Clarke, in his well-known work, referred to two principal forms of leucorrhœal discharge, under the heads of "transparent mucous discharge" and "white mucous discharge." These two kinds of discharge he defined in the following terms.

"By transparent mucous discharge is meant, that which is gelatinous, nearly transparent, and capable of being coagulated."

"The white mucous discharge is opaque, of a perfectly white color; and it resembles, in consistence, a mixture of starch and water made without heat; or thin cream."

The transparent mucous discharge is referred to the vagina, and

two varieties are given, the one dependent on increased action of the vessels of the parts, the other upon debility.

The white mucous discharge was believed by Sir Charles Clarke to depend upon a morbid condition of the glands of the cervix uteri. He states that "wherever the white mucous discharge is present, there will be found on examination, a tenderness of the cervix of the uterus," and he was further of opinion that the inflammatory condition of the cervix uteri which produced the white discharge sometimes laid the foundation of carcinomatous disease. I believe these opinions respecting the sources of the two kinds of leucorrhœal discharge ought to be reversed. I have found the transparent mucous discharge, when in excess, to be invariably connected with disorder of the mucous glands of the canal of the cervix. On the other hand, the "white mucous discharge," according to my observations, depends upon the epithelial secretion of the vagina, or the vaginal portion of the cervix, the only exception being, when the transparent mucus of the cervix is whitened by the coagulating effects of the acid vaginal discharge. I have no doubt Sir Charles Clarke was misled by this effect of the vaginal secretion upon the cervical discharge.

The following description evidently refers to the cervical mucus when renderedropy by the vaginal acid.

"In many instances, the white mucous discharge is much thicker than cream, having the tenacity of glue; and perhaps this is the state in which it comes away from the cervix uteri. This corresponds with the mucus which is separated from the cervix, when at the commencement of labor. Usually, when the white opaque mucus possesses the tenacity just mentioned, it does not flow spontaneously, but it remains in the vagina, until the exertions employed to empty the rectum squeeze out, at the same time, the contents of the vagina."

Another author, Dr. Ashwell, states unhesitatingly that "the secretion from the glands of the cervix uteri is not often found in common leucorrhœa." He considers the vagina as the great source of leucorrhœal secretion, and gives great importance to the muciparous glands of the ostium vaginalæ as a source of the discharge. He goes so far as to say that "in mild leucorrhœa, it may be assumed that the muciparous glands at the entrance of the vagina, and the lining membrane of the canal, are alone affected." After a general con-

sideration of the nature and varieties of leucorrhœa, Dr. Ashwell observes :—

" I have thus attempted to elucidate the history and symptoms of this prevalent disease, without adopting the division into vaginal and uterine leucorrhœa. Independently of symptoms, it is allowed to be very difficult to distinguish which portion of two continuous membranes of identical structure are morbidly furnishing a nearly identical secretion; it seems much easier, and more rational, that the diagnosis should rest on the severity of the symptoms and the difficulty of cure. It is known that the vagina is much more frequently the seat of disease than the cavity of the uterus, and in the majority of instances, it yields more readily to remedies. Thus, where there is marked aggravation of symptoms, and considerable constitutional derangement, the uterine membrane is probably implicated; but when, on the contrary, the whole of the symptoms are locally and constitutionally slight and easily cured, the vagina will generally be found to be the seat of disease. The frequent implication of both the vaginal and uterine secretory surface, and the difficulty of distinguishing, even where one only is morbidly affected, which it is, will often perplex the diagnosis, whatever divisional arrangement be adopted."

Dr. Ashwell is further of opinion, that in all instances in which the uterine mucous membrane is implicated, "the vessels eliminating the catamenial fluid furnish the discharge." But he observes, "doubtless when there is pregnancy, with a sealed os, the leucorrhœa, however severe, must be vaginal."

Dr. Ashwell is well known as a physician of large experience, and the fullest writer in this country on the subject of leucorrhœa. But it would be difficult to find any stronger argument for the revision of the whole subject, than that afforded by the uncertainties and errors contained in the extracts just made. Almost every one of the statements they contain requires modification. Nothing relating to leucorrhœa is more common than to find the secretion from the glands of the cervix in ordinary leucorrhœa. Indeed, the excessive secretion of these glands constitutes the most prevalent variety of leucorrhœa. The vagina is not the great source of leucorrhœa, nor are the vaginal and cervical mucous membranes identical in structure. The examination of the discharge by the microscope renders the diagnosis between vaginal and cervical leucorrhœa easy and certain, and makes the appeal to the severity or mildness of the disease

unnecessary. Such an appeal is, moreover, most unsatisfactory, since some cases of vaginal leucorrhœa are quite as obstinate as the worst cases of cervical leucorrhœa. I do not say that cases of leucorrhœal discharge from the fundus uteri may not exist, but I have never seen a case of leucorrhœa in which the secretion was eliminated by the vessels which furnish the catamenial secretion : on the contrary, even in cases of vicarious leucorrhœa, as it is termed, the secretion is, I believe poured out by the mucous follicles of the cervical canal. So far from leucorrhœa when the os uteri is sealed, during pregnancy, being necessarily vaginal, I have found the most common form of leucorrhœa during gestation to consist of an excessive formation and discharge of the mucus, which constitutes the plug, and seals the os in cases of pregnancy without leucorrhœa. I ought to say, that many of these erroneous views do not belong to, or originate with Dr. Ashwell, but have been accumulated from many sources in the absence of anything like exact or positive investigation.

The views entertained by Dr. Henry Bennet, respecting the sources and constitution of the utero-vaginal discharges, are set forth in the following passage :—

“The white creamy mucus is secreted by the mucous membrane of the cervix, and possibly of the upper part of the vagina when congested ; and as congestion of these membranes may exist physiologically, its presence does not necessarily indicate disease. A large portion of the female population of towns present more or less of this white leucorrhœal discharge during the physiological congestion which precedes and follows menstruation ; but so long as they are free from local inflammation, its existence is of no importance, as, alone, it neither gives rise to local nor general symptoms. When, however, it is very abundant, and persists throughout the menstrual interval, the circumstance is a suspicious one, and on examination there will be generally found some inflammatory condition of the cervix which keeps up the congestion. If the white mucus is mixed with the transparent mucus or pus, the existence of inflammation is certain. But in that case there are always some local or general symptoms. Such being the case in nineteen instances out of twenty, in which a female seeks professional advice for leucorrhœa, she will be found, on examination, to be suffering from some inflammatory disease of

the uterine region. Were there not local disease, she would attach no importance to the discharge, feeling no inconvenience from its presence.

"Theropy transparent discharge is secreted by the numerous mucous follicles of the cavity of the uterine neck, and its existence in any quantity is a certain sign of inflammation of that cavity. Theropy mucus may possibly be merely a hypersecretion of the mucous follicles of the cervical cavity, the result of the inflammation of the vascular framework of the mucous membrane in which they are imbedded. Whether or not this be a correct explanation of the fact, it is certain that whenever an abundant ropy secretion exists, the os and cavity of the cervix, on careful inspection, are found open, red, inflamed, or ulcerated."

With reference to the remarks of Dr. Bennet, I would observe that the white creamy mucus is secreted by that portion of the mucous membrane of the cervix which projects into the vagina, but not by the cervical mucous membrane generally. It is also secreted by the vagina, not merely at its upper part, but by the whole extent of the vaginal surface. This form of secretion is not nearly so common in leucorrhœa as Dr. Bennet supposes. The ordinary white discharge consists generally of the cervical mucus which has been curded by the acid secretion of the vagina. Dr. Bennet's description would only apply to the white epithelial discharge. So far from considering the presence of the transparent mucus in the vagina as an unequivocal sign of inflammation, I believe it to be frequently present in relaxed habits without any inflammatory disorder. It is found whenever the secretion of the cervical canal is in such excess, and the vaginal acid is so weak, that it is not coagulated. There can be no doubt that the transparent ropy discharge is simply an increase of the true secretion of the mucous follicles of the cervix. To the relations between this secretion and inflammation and ulceration of the os and cervix uteri, I shall have hereafter to refer.

Dr. Whitehead gives the following account of the discharges in leucorrhœa.

"There are two well-marked varieties of this affection (mucous leucorrhœa), distinguished by the sensible properties of the discharge, and the source whence it issues. In one, the secretion is a transparent, glairy fluid, of the consistence of the white of egg,

communicating no stain, but only a hardness to the linen upon which it is allowed to dry, like that produced by albumen or starch. Generally it has an alkaline re-agency, which is very decided when tested at the mouth of the uterus, but becomes more faintly so on its arrival at the os externum, especially if incorporated with any considerable proportion of the vaginal secretion, in which case it may become more or less acid. It is sometimes furnished by that portion of the vaginal membrane which is reflected upon, or is in the immediate vicinity of, the cervix uteri, but it is much more frequently the product of the internal surface of the uterus, especially the cervical portion of it, thus constituting the true uterine catarrh of most authors. It indicates a state of high vascular excitement, but not of suppurative action of the part whence it issues. It sometimes, though rarely, exists as a vaginal catarrh, unattended with uterine irritation, and is then accompanied by great heat and feeling of discomfort about the vagina, irritable bladder, and general constitutional disturbance.

* * * * *

"The other form of mucous leucorrhœa is peculiarly an affection of the mucous membrane of the vagina. It is characterized by an opaque discharge, of a clear whiteness, having the consistence of very loose curd or cream. It is not glairy, or but very slightly so, and exhibits an intensely acid secretion. It is often furnished in great abundance, being attended with constant aching and sense of constriction around the lower part of the person, œdema of the extremities, and sometimes of the face, great lassitude, palpitations, and general anaæmia. It is to this form of leucorrhœa that the term 'fluor albus,' and 'the whites,' appear to be especially applicable. The vagina is much relaxed in this form of complaint, and there is often œdema, with a troublesome itching of the vulva."

The first part of Dr. Whitehead's description of the transparent variety of leucorrhœa is excellent, but I believe he is wrong in supposing that this discharge is ever secreted by the vagina, or the vaginal portion of the cervix. According to my experience, it is solely the product of the mucous crypts and follicles of the canal of the cervix uteri. In my opinion, neither the fundus uteri, nor the vagina, has any share in its formation. When seen in the vagina, it has probably flowed down from the cervical canal, and in such quantity as to have escaped coagulation by the vaginal acid. I have never seen the transparent discharge in the form of vaginal catarrh. The

proper vaginal secretion in leucorrhœa consists either of scaly epithelium in flakes, or epithelium and plasma in the form of curdy or creamy matter, blood and pus being sometimes added. With Dr. Whitehead's description of the common white vaginal discharge I agree, only I believe that this is not always, as he supposes it to be, the product of the vagina alone. Where the mucous discharge from the canal of the cervix descends into the vagina and becomes coagulated, it looks so much like the ordinary epithelial vaginal secretion, that it is impossible to distinguish between the two with the naked eye alone.

It is difficult, perhaps, to prove absolutely that the leucorrhœal discharge does not in some cases come from the Cavity of the Fundus Uteri. There are, however, many reasons for believing that leucorrhœa very rarely depends upon the mucous membrane of the fundus and Fallopian tubes. There are, certainly, glands in the mucous membrane of the uterine body, but there is no secreting structure in this situation at all equivalent to the glandular structure of the uterine neck. I have examined a large number of uteri, and I have never found any excessive secretion in the cavity of the fundus, though this is very common in the cervical canal. Leucorrhœa is very common during the whole of pregnancy; and in the latter part of gestation, it is impossible that any of the secretion can be supplied by the mucous membrane of the body of the uterus. The Leucorrhœa of pregnancy does not differ in any respect from the leucorrhœa of the unimpregnated woman, which we might certainly expect to be the case sometimes, if the fundus uteri were a common seat of the disorder. In procidentia uteri, when the os uteri and the lower part of the cervical canal are exposed to the irritation of the external air, the mucous secretion from the cervical glands is almost always profuse, and differs in no respect from the discharge in cervical leucorrhœa, except that it is transparent, because there is no admixture of vaginal acid. In such cases the act of secretion in the cervical follicles can be seen, as the lips of the os uteri are frequently so everted as to render the rugæ visible. On the other hand, in inversio uteri, there is no mucous discharge from the exposed mucous membrane of the fundus, but the patient is drained by constant and excessive loss of blood. It appears then, that the irritation which in the cervix uteri gives rise to leucorrhœa, in the fundus uteri causes menorrhagia. In cases of polypus uteri,

or fibrous tumors in the walls or cavity of the organ, when the fundus uteri is irritated, we observe that sanguineous discharge is almost always present. These considerations appear to me to offer very strong evidence against the supposition that the fundus uteri is a common source of leucorrhœal discharge.

The sequelæ of mucous or cervical leucorrhœa—namely, induration, hypertrophy, and ulceration of the os and cervix uteri—will form the next subject of consideration.

CHAPTER V.

THE SEQUELÆ OF LEUCORRHœA: INFLAMMATION, ABRASION, ULCERATION, INDURATION, AND HYPERTROPHY OF THE OS AND CERVIX UTERI, AND ABRASION AND SUPERFICIAL ULCERATION OF THE VAGINA.

CERVICAL leucorrhœa rarely exists for any length of time without being attended by various morbid changes involving the os uteri, the external portion of the cervix uteri, and the lower portion of the cervical canal. I need scarcely say that these changes, under the names of inflammation, ulceration, induration, and hypertrophy, have of late been treated of as distinct and independent affections. It has been sought upon this basis to raise a system of uterine pathology of considerable pretensions. In fact, in the excessive prominence given to disordered states of the os and cervix uteri, leucorrhœa itself has been quite eclipsed, or set aside as a subordinate symptom. It is my conviction, notwithstanding, that in the majority of cases in which morbid states of the os and cervix are present, cervical leucorrhœa, or, in other words, a morbidly augmented secretion from the mucous glands of the cervical canal, is the most essential part of the disorder, and that the diseased conditions of the lower segment of the uterus, which have been made so prominent, are often secondary affections, resulting from the leucorrhœal malady. Everything has been made to bend to the hypothesis which sets forth inflammation as the keystone of uterine disorder. Laborious disquisitions have been entered into, respecting the vascularity of the os and cervix, the existence or non-existence of a mucous membrane in this situation, and the absence or presence of cellular tissue in the substance of the cervix uteri, as conditions which have been supposed necessary to the establishment of the theory of inflammation. I believe the truth, however, to be, that this part of the generative system is the seat of frequent disorder, chiefly from the circumstance that it is the boundary at

which cutaneous tissue ends and mucous tissue begins. The vagina must be considered as an internal prolongation of the skin, and it is only at the labia uteri that the true mucous membrane really commences. Disordered conditions are very common in such situations in other parts of the body, but in the case of the os and cervix uteri, the different chemical conditions of the uterine and vaginal mucus, and the tendency to their retention within the vaginal and cervical canals, furnish us at once with additional reasons why disordered conditions of these parts should be frequently met with—reasons so palpable, that I think we need scarcely search for more recondite explanations.

Vascular Injection of the Os and Cervix Uteri.—The most simple morbid state of the os uteri which is met with in leucorrhœa, is a ring of vivid redness surrounding the os tincæ. Sometimes this ring is narrow and confined to the margin of the os uteri; at others, it is broad, and involves the whole or greater part of the surface of the os, or it may be chiefly confined either to the anterior or posterior lip. It, however, almost invariably involves the margin of the entire orifice. I have very rarely seen a case in which this condition of the outer portion of the os existed, without the implication of the margin at the entrance of the cervical canal, except in eruptive conditions of the os uteri, or mechanical injuries. There is no actual lesion of the surface in cases of the kind now described; the condition consists of increased vascularity, with rapid shedding of the epithelium of the part. A plug of alkaline mucus is very constantly seen in such cases hanging from the canal of the cervix through the os uteri, and I have little doubt the redness and vascularity are generally dependent upon the constant irritation of the acid surface of the margin of the os uteri, by the alkaline cervical discharge. This state of the uterus is frequently met with after death, and I have found, upon minute examination, that it shows nothing beyond fulness and turgidity of the vascular loops of the villi or papillæ beneath the epithelium.

Epithelial Abrasion of the Os and Cervix Uteri.—The next morbid change consists of loss of epithelium, and partial or entire denudation of the villi. To the naked eye, a red circle of excoriation surrounds the os uteri. When the denudation is partial, the red points of the villi may be seen through the epithelium, and when it is entire, the redness is more intense than it is in mere

vascular injection, and the border of the red portion is more abrupt and defined. It assumes the same shape as the superficial vascular redness, and, like it, as constantly extends outwards from the margin of the os uteri. It sometimes involves the whole surface of the os uteri, and extends to the upper part of the vagina, and also ascends within the canal of the cervix. The denuded surface does not generally secrete pus, but an abundance of mucous plasma and epithelial scales is produced, and the surface frequently bleeds upon slight irritation. To the naked eye the abrasion appears rough, and to the touch it feels erectile and "velvety,"—a term which has very commonly been applied to what has been considered ulceration of the os and cervix uteri. The villi do indeed, in this condition, stand out somewhat like the pile of velvet, and in some cases the villi themselves are considerably enlarged. When such cases are examined microscopically after death, the villi are seen with their vascular loops, but with entire loss of their epithelial covering. The naked villi are sometimes so large as to be visible, and they look like an irregular fringe skirting the uterine aperture. This state has been considered one of superficial ulceration ; but epithelial abrasion is the only morbid change which exists in cases of this kind, and it is nothing like that state which is considered ulceration in other parts of the body. If this were to be considered genuine ulceration, we must apply the same term to the simple loss of the epidermis after the application of a blister to the skin. In leucorrhœa it is, I believe, caused, like the superficial redness, chiefly by the irritation of the os uteri from the alkaline cervical discharges. This loss of epithelium is the most frequent change which I have met with upon the surface of the os uteri in cases of ordinary leucorrhœa.

Superficial Ulceration of the Os and Cervix Uteri.—When these changes have proceeded a step further, there is found not merely loss of the dense layer of epithelium covering the os uteri, but the villi, both of the external surface of the os uteri, and of the mucous surface within the labia uteri, are destroyed entirely or in patches. It is this condition which constitutes the granular condition of the os uteri. In that state of the os uteri, which upon examination after death would be pronounced to be undoubtedly superficial ulceration, the condition which generally obtains is a partial or entire loss of the epithelial layer, around the os uteri, in circum-

scribed patches, and here and there the partial or entire destruction of the villi. This loss of the villi gives an eaten, corroded appearance to the surface of the os. Such a condition of the os uteri

FIG. 23.



Circumscribed ulcer of os uteri, showing the removal of the epithelium, and erosion of the villi. The ulcer is surrounded by a fringe of enlarged villi. 20 diameters.

may be limited in extent, or it may spread over the whole of the os and external portion of the cervix, and pass within the labia uteri. In this state there is a free secretion of purulent, or muco-purulent fluid. Sometimes small circumscribed ulcers are seen in these cases, in which the denuded or partially denuded villi are found surrounding the edge of the ulceration, the area of the ulcer itself being bare of villi, or the ragged *débris* of the villi appearing at the bottom of the ulcer. These small ulcerations appear commonly in eruptive disorders of the os uteri, complicated with leucorrhœa, but they represent very perfectly the loss of epithelium and villi, and to a more complete extent than is found in diffused patches of dis-

eased surface. On the surface of the os uteri, superficial ulceration does not go beyond the removal of the epithelium and villi, but I have seen a portion of the rugæ in the lower part of the cervical canal itself eaten away in very severe cases. We can easily understand how bleeding should frequently occur under such circumstances, the vascular loops of the villi being laid bare by the loss of epithelium, and the loops themselves partially destroyed by superficial ulceration.

Inversion of the Canal of the Cervix Uteri.—There is another state of the os and cervix uteri in leucorrhœa which has hitherto, as far as I am aware, escaped observation. In long-continued irritation of the canal of the cervix, partial inversion of the lower part of the cervical canal may slowly take place, causing increased pain and distress, and aggravating the leucorrhœal symptoms. The lower part of the cervical canal is frequently so inverted that it comes into contact with the vagina, and the penniform rugæ may then be seen upon examination. I have found this condition after death, when the use of the speculum could have had no share in the eversion of the labia uteri. When the cervix uteri is thus so everted or inverted as to bring the penniform rugæ into view, an appearance is presented which might very readily be mistaken for ulceration, and I suspect that what has been called the "cockscomb" granulation or ulceration, is often formed in this way, the serrated edges of the so-called ulcer being in reality the penniform rugæ presenting at the os uteri, denuded of epithelium, and florid and enlarged. Whenever inversion of the cervical canal takes place, the portion of the canal brought into view is of a deeper red than the surface of the os uteri. The villous surface of the partially inverted cervix, even when there has been no loss of surface whatever, very much resembles the granulations of an ulcer to the naked eye, and I have no doubt they have been frequently mistaken for them. The simply open state of the os uteri, so generally found in leucorrhœa, appears to me to depend, not as commonly supposed, upon muscular dilatation, but upon a development of the os and cervix, caused by continued irritation, and to be somewhat similar to the development of these parts in the early months of utero-gestation.

In maintaining the important part played by the cervical secretions in inducing morbid conditions of the os uteri, I do not wish to

be understood as saying that they are the only causes of these conditions. What I contend for is, that in the majority of cases in which leucorrhœa is present, in combination with non-malignant disease of the os and cervix, the morbidly active condition of the cervical glands is the primary and essential disorder. Among the other causes of morbid change in the os and cervix uteri, the varying vascular and mechanical conditions of these parts in menstruation, coitus, pregnancy, and parturition, must of course be enumerated. Eruptive conditions of the cutaneous covering of the os uteri, in the shape of aphtha, herpes, or eczema, form another class of causes of cervical discharge. Vaginitis may also extend upwards, and involve the os and cervix ; and I believe, that in some of the worst cases of leucorrhœa, when the disease is incorrigible under the use of all ordinary remedies, it is occasionally the sequel of gonorrhœa, and sometimes a manifestation of constitutional syphilis. The descent of polypi through the cervix and os uteri excites the cervical glands, and frequently damages the os uteri by mechanical pressure, producing ulceration both of the os uteri and the polypus itself, a state in which adhesion sometimes takes place between the polypus and the os uteri. But in these cases cervical leucorrhœa is almost invariably produced, and it generally tends to aggravate the other disordered conditions of the os and cervix. I may add that I do not mean to deny the occasional existence of inflammation of the os and cervix uteri having an independent type, though I think this is of comparatively rare occurrence. I must not omit the influence of the position of the uterus in producing disorder of its lower portion. The os uteri is seldom exposed to the air, as in procidentia, without extensive loss of the epithelium around the os, and sometimes villous ulceration follows. The same things happen, though to a less extent, in all grades of prolapsus. The exposure of the os uteri either to the atmospheric air or to the highly acid secretion of the lower part of the vagina, is almost certain to take off the epithelium covering the surface, and it frequently produces still more decided pathological results. But in these displacements cervical leucorrhœa, with or without vaginal leucorrhœa, is the constant accompaniment. Indeed, I may sum up by saying, that I know of nothing more certain in reference to uterine disorder, than that it is extremely rare for cervical leucorrhœa to exist without inducing disorder of the os uteri ; and, on

the other hand, disorder of the os uteri very rarely occurs without exciting leucorrhœa, and the leucorrhœa thus excited is almost sure to aggravate the original disorder. I repeat, that when leucorrhœa occurs as a secondary disorder, it generally tends to aggravate the disordered conditions which precede it. The chief exceptions to this are in simple inflammatory states of the os uteri, or the congestion of the os and cervix which sometimes occurs in amenorrhœa. In these cases a profuse secretion of the cervical glands relieves the loaded condition of the parts for a time ; but if the discharge becomes continuous, it is almost certain to induce morbid changes at the os uteri.

The secondary character of the so-called ulcerations of the os uteri, and their dependence upon "uterine catarrh," or cervical leucorrhœa, has been suspected by several writers on uterine disease. But, in the absence of a definite knowledge of the structure of the parts concerned, and their secretions, it has been objected, that uterine catarrh is not invariably accompanied by lesion of the os uteri, and that ulceration sometimes exists without the accompaniment of any catarrhal flux from the uterus. These reasons, advanced by Duparcque, were thought so valid and unanswerable by Dr. Evory Kennedy, that he relinquished the idea as preposterous. But I submit that, taking excessive and morbid cervical secretion to be the common cause of abrasion of the os uteri, it would not be at all extraordinary to meet with some cases in which, notwithstanding the leucorrhœal flow, the epithelium might remain healthy, either from greater thickness or vitality than usual in this membrane, or from the unirritating nature of the discharges in certain cases. I have carefully observed a large number of cases, and although I have occasionally found cervical leucorrhœa to exist without any marked derangement of the os uteri, I have very rarely found the os uteri abraded without also finding the existence of increased action in the glandular portion of the cervix, unless in cases of eruptive disease. Even in eruptive disease commencing in the vaginal portion of the cervix uteri at a distance from the os, the secretion of the cervical canal is generally profuse. I have also found, in treatment, that the best way to restore the os uteri to a healthy condition, in such cases, is by restraining the cervical secretion ; but, on the other hand, that the morbid state of the os uteri may be remedied again and again, with a tolerable certainty

of the recurrence of the disorder, unless the cervical secretion be brought back to the healthy condition. The loss of portions of epithelium, the first step towards ulceration, is so common in cases of confirmed leucorrhœa, that there must be some very frequent and simple cause which produces it, and it appears to me that it is far more reasonably accounted for by looking to the irritant discharges than in any other way. We know that the mucous surfaces, accustomed to acid secretions, are irritated by the continued pressure of alkaline states, as, for instance, the stomach under the constant use of alkalies, the bladder in the secretion and retention of alkaline urine, or the urethra in spermatorrhœa. Nothing is more common than for discharges from the eyes, ears, nares, and mouth, to excite irritation of the skin at the margin of the several orifices from which these discharges proceed, and it cannot be too strongly insisted on, that the covering of the os uteri is identical with the skin, and that in this situation there is the peculiar disadvantage of the constant tendency to the accumulation of the discharges coming down from the cervix uteri. Thus it appears to me that the attention of the profession should be brought back from the inflammation-theory to the study of leucorrhœa on a sounder basis, both as regards its pathology and treatment, than has hitherto prevailed. To this, the inquiry into the exact pathology of the os and cervix uteri, and their morbid secretions, it appears to me, inevitably tends.

Induration and Hypertrophy of the Os and Cervix Uteri.—The long continuance of leucorrhœa, and the consequent irritation, generally induce induration and hypertrophy of the os and cervix. In some cases the enlargement of the cervix appears to consist of fibrinous effusion in the substance of the cervix; in others it is simply œdematosus, or there may be a varicose state of the cervix; but cases occur where, from the hardness of the enlarged os and cervix, it is most probable that a true hypertrophy of the fibrous tissue of the cervix takes place. The hypertrophied cervix uteri takes very different forms in different cases. The whole of the cervix may be enlarged equably, or the hypertrophy may be confined to the anterior or posterior lip. In the distortion of the os uteri by hypertrophy, some portion of the canal of the cervix is generally everted, and the everted portion is more vascular than the surface of the os, and frequently denuded of epithelium. In women

who have borne children, the hypertrophy is rarely symmetrical, but is found in the form of irregular knobs divided by deep fissures. These fissures are often in a state of ulceration, pus is secreted in abundance, and some care is required in the diagnosis between such cases and the commencement of carcinoma.

By observing cases of mucous or cervical leucorrhœa under every variety of circumstances, we may obtain a tolerably correct knowledge of the different stages of the disease, and we may learn the order in which its sequelæ make their appearance, when it is allowed to run its course for a considerable time unchecked. In the first place there is simply an increase of the secretion of the cervical mucus. Instead of the formation of the plug after each monthly period, there is a constant escape of thick mucus from the os uteri. But in this phase of the disorder, there is little constitutional or local disturbance. The size of the os and cervix is not increased, and the surface of the os remains quite natural, both as regards volume and color. After a time the os uteri gapes; there is relaxation of the cervix, the upper part of the vagina loses its tone, and some amount of prolapsus generally occurs. With this, the ring of superficial redness appears around the margin of the ostincæ. These occurrences all tend to increase the quantity and acridity of the discharges. The superficial redness slowly passes on to the destruction of the epithelium; then the loss of the villi takes place, and the formation of the granular surface upon their base occurs. The whole of the os and cervix now becomes swollen and turgid, induration commences, and fibrinous deposit in the substance of the cervix frequently takes place. The sensibility of the different portions of the utero-vaginal canal varies greatly in different cases. In some, the abraded or hypertrophied os uteri is exquisitely tender; while in others its sensibility is little, if at all, increased. Uterine neuralgia, like neuralgia in other parts of the body, seems to depend more upon constitutional than local causes. In some cases of leucorrhœa, in which abrasion occurs, the whole of the os uteri and the cervix hangs into the vagina completely denuded of its tegumentary covering, but there is no great enlargement of the parts. In others there is considerable hypertrophy, without any destruction of epithelium or loss of surface. In some of these cases it appears as though the hypertrophy had been slowly induced from chronic irritation of the cervix, without any loss of

surface. In others, from the previous existence of muco-purulent discharge for months, or even years, it is probable that abrasion or erosion of the os and cervix has formerly existed, but has perfectly healed, leaving the hypertrophy behind. It appears to me that in most of the cases which come before us for treatment, cervical mucous discharge is the first sign of disorder, and hypertrophy the last result; the other conditions of loss of structure on the surface of the os and cervix, with the mucoid, puriform, and sanguineous discharges which attend them, are intermediary.

Epithelial Abrasion and Superficial Ulceration of the Vagina.—The changes which take place in the vagina in vaginal leucorrhœa, are in many respects similar to those which occur at the os uteri. In cases of chronic epithelial leucorrhœa, or epithelial vaginitis, the whole of the vagina and vaginal portion of the cervix becomes of a vivid red color, from the peeling off, or rapid shedding, of the epithelial coat. The appearance presented is as though the superficial layer of the vagina had been carefully dissected away. Sometimes this condition extends from the margin of the os uteri to the outlet of the vagina, and is accompanied by severe pain on intercourse, inability to walk, and great suffering during the catainenial periods. One of the worst instances I have seen of this kind, was that of a young married lady, who came to me from one of the Western States of America. She had been bedridden for several years, and could not stand or move without experiencing great pain. Her case was one of the most perfect specimens of irritable uterus I have ever met with. A state of intense neuralgia of the lower part of the uterus and the vagina rendered her life almost insupportable. She was brought to this country on a couch, ingeniously constructed by her husband, which was so balanced as to continue steady during the movements of voyaging and travelling. The whole of the epithelial surface, from the cervical canal to the ostium vaginæ, was perfectly raw and denuded of epithelium. In this case, long-continued epithelial vaginitis, with flaky epithelial discharge, had destroyed, as it generally does, the tone of the vagina, and the entire denudation of the vaginal surface was attended by prolapsus uteri. I have frequently had occasion to notice in such cases, that the altered sensibility of the vagina gives rise to severe hysterical attacks. In other cases, not attended by greater local or constitutional derangement than those above referred to, there is besides

removal of the epithelium, the destruction of the subjacent villi by superficial ulceration. This condition is generally limited to the upper half of the vagina and the vaginal portion of the cervix. The surface appears granular, and is bathed in pus, which sometimes evolves a strong smell of sulphuretted hydrogen, from being confined in the cavity of the vagina. Cases of this kind are very distinct from those of scrofulous ulceration of the vagina, in which the ulcerations are defined and attended by loss of substance; but as far as I have observed, epithelial denudation and villous ulceration of the vagina, are more frequently observed in scrofulous than in other habits. In some of the worst cases of this kind which have come under my notice, the subjects of the disorder were either suffering from scrofulous ulceration in other parts of the body, or carried the cicatrices of former ulcerations, and I have once or twice seen it associated with pulmonary phthisis.

Constitutional Derangement consequent upon Leucorrhœa.—The modes in which leucorrhœa and its complications may disorder the general health are numerous. In the first place, the direct loss from a profuse discharge of this kind spread over months or even years is very considerable. I have referred to the great quantity of mucus secreted in some cases, and as the cervical mucus is a highly albuminous fluid, a profuse discharge of this kind constitutes a severe drain to the constitution in delicate subjects. The discharge of blood from the lower ~~segment~~^{part} of the uterus in leucorrhœa is not uncommon, and sometimes leucorrhœal patients suffer all the symptoms consequent upon excessive hemorrhage. In other cases, the profuse secretion of pus goes on, the purulent discharge producing mischief by the direct loss it entails, and by its constitutional effects. Shut up in the vagina, the constant presence of pus in the upper part of this canal acts in somewhat the same manner as it does in abscesses in other parts of the body, producing night sweats, hectic fever, and diarrhœa, apparently from the absorption of the liquor puris. Another mode in which leucorrhœa produces debility, is by the sympathetic derangement of the stomach which frequently accompanies it. Many leucorrhœal patients suffer from nausea, habitual dyspepsia, and other gastric symptoms, similar to those of early pregnancy. The catamenial complications of leucorrhœa also tend to the production of constitutional disorder. In some cases we have to deal with the inertia of partial or entire amenorrhœa, in others

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with the anaemia caused by menorrhagic tendencies. The derangements of the nervous system in leucorrhœa are sometimes highly marked. Cases are met with, in which the "heat and chill disorder," as it is termed, is very troublesome. Patients suffer all the disagreeable sensations attendant upon the catamenial climacteric or "change of life." The pains which attend some cases of leucorrhœa must not be forgotten. The pain in the back, the peculiar pain in the left side, and the pain in the thighs, are reflex or sympathetic morbid sensations, but they cause great distress, and unfit the patient for exercise. I believe that what is called the irritable uterus, is nothing more than leucorrhœa attended by a neuralgic condition of the os and cervix uteri. Much inconvenience connected with the bladder and rectum is sometimes experienced in leucorrhœa, the vesical and rectal irrelations being generally dependent on reflex sympathies between the uterus and the other pelvic viscera.

Physical Characters of Leucorrhœa, and the principal Points of Diagnosis between Leucorrhœa and Cancer Uteri.—The discharges in leucorrhœa are generally free from any disagreeable smell. In some cases in which pus accumulates in the after part of the vagina, the discharge becomes very fetid. This is particularly the case when suppurative action is going on in the upper part of the vagina, and when the lower part of the canal and the ostium vaginalæ is contracted. When the suppurative action is confined to the os uteri, or the discharge is from the canal of the cervix, there is seldom anything more than the natural faint pus odor. Sometimes the pus secreted in the upper part of the vagina resembles the decomposed matter of deep-seated abscess. In cancer, the fetid smell of the discharge is one of the most constant characteristics of the disorder. It is rarely absent, and is frequently so powerful as to pervade the room in which the patient may be. The cancer smell somewhat resembles the scent of lilac or jasmine, mixed with an intolerably fetid odor. It once happened to me when examining a suspicious case, to have some rancid pomade scented with jasmine, given me to put on the finger, and the scent so strongly resembled the cancer odor, that I was puzzled until I detected that it did not belong to the discharge. The only other conditions in which the uterine discharges are fetid are in cases of polypus and in retained placenta.

To the naked eye, the commencement of carcinoma of the uterus

can sometimes scarcely if at all be distinguished from common induration. Common induration may be quite as solid and stone-like to the touch as the cancerous hardness, but the schirrous affection often extends from the os uteri to the structure before and behind it, so that the os uteri becomes fixed, whereas this never happens in cases of simple induration, except in cases where there has been ulceration and cicatrization of the vagina. If it should happen that an incision be made into the induration, there is no longer any doubt, as the gritty sensation conveyed by schirrous uteri is altogether unlike that of simple ulceration. The age of the patient is of some value in the diagnosis, as common induration frequently occurs in young childbearing women, while schirrus is more common, as the catamenial decline approaches.

When cancerous induration begins to soften, especially if this process takes place slowly, the granulations are frequently red, even, and with a tolerably clear and well-defined margin. To the naked eye alone, the difference between malignant and common ulcerations is sometimes inappreciable. As soon, however, as ulceration commences, digital examination readily settles any doubt. The ulceration in cases of carcinoma is always rough, indurated, and harsh to the touch, while common ulceration is as constantly soft and yielding to the finger. If the speculum alone be trusted to, it is easy to mistake carcinomatous ulceration for simple ulceration, and *vice versa*. A short time since I had a case under my care at St. Mary's Hospital, sent to me by Mr. Truran, of Truro, in which the naked-eye appearances were very deceptive. The case was considered to be one of corroding ulcer, but at the time she was admitted, I happened to have a scratch upon the index finger, and examined her in consequence with the speculum only; the ulceration of the os and external surface was so smooth, and the natural shape of the os and cervix was so well preserved, that I hesitated about considering it as carcinomatous. A few days afterwards, when I examined her digitally, there was no question about the matter, but the information conveyed by sight and touch is sometimes, as in this case, quite contradictory, and, therefore, visual examination cannot alone be depended on. On the other hand, I have known simple ulceration present such an appearance to the eye as to lead to the strong suspicion of cancer, but the slightest touch of the finger has been sufficient to dispel the alarm. The occurrence of hemorrhage is of some

value in a diagnostic point of view. Hemorrhage occurs in simple ulceration, but the loss is hardly ever so sudden and of such an extent as often occurs in cancer.

The examination of the discharge by the microscope does not invariably give satisfactory evidence in cases of carcinoma, but generally the heterogeneous compound cells, and the ill-formed cancer pus-cells are present, mixed up with enormous quantities of epithelium.

CHAPTER VI.

THE RELATIONS BETWEEN SECONDARY SYPHILIS AND LEUCORRHœA.

I AM persuaded that far too little importance has hitherto been given to the connection between Constitutional or Secondary Syphilis, and obstinate Leucorrhœa with disease of the os and cervix uteri. It is satisfactorily proved that the genuine chancre is rare upon the os uteri, but that in secondary and tertiary syphilis, leucorrhœa is very common. These facts are well ascertained, but the mode in which the morbid states of the os and cervix uteri, and the accompanying leucorrhœa, are produced, has not been satisfactorily investigated. It has remained a doubtful question whether these complications ought to be considered as syphilitic or non-syphilitic.

Dr. Henry Bennet treats at some length of what he terms the "non-chancrous-looking ulcerations of the cervix, which so frequently complicate blennorrhagia, and the various secondary forms of syphilis." He also points out that ulcerations of this kind are extremely frequent in patients suffering from any of the forms of syphilis, "primary, secondary, or tertiary." According to my opinion, it will be convenient to set aside the conditions of the os uteri, which depend either on primary syphilis or on blennorrhagia, as entirely distinct from the morbid conditions which depend on secondary syphilis. The reasons for this will appear in the sequel. Dr. Bennet states that M. Gibert examined five hundred syphilitic women at the Lourcine Venereal Hospital, and that out of this number, one hundred and forty presented granular erosion of the cervix uteri, which was generally accompanied by cervical leucorrhœa. From the form and appearance of the granular surface, together with its frequent co-existence with other syphilitic symptoms, M. Gibert was led to consider this condition of the cervix uteri "as a distinct species of syphilitic ulceration, which he appears to think in many cases succeeds to chancres." Dr. Bennet himself examined a large

number of patients affected with cutaneous syphilis at the Hôpital St. Louis, and found a still greater proportion of cases in which the cervix uteri was in a morbid condition. He, however, arrived at a very different opinion of their nature from that held by M. Gibert. Dr. Bennet says :—

“Admitting that these ulcerations are not primary syphilitic sores, is it equally true that they are merely inflammatory? May they not be secondary? That some may be so I think is probable; but I do not believe it probable that more than a very small number can possibly have such an origin. On the one hand, affections of the mucous membrane are not so very common (as secondary symptoms of syphilis), and on the other, a secondary ulceration of a mucous surface presents peculiar characters, which are not those usually observed. I have, however, seen ulcerations of the cervix in syphilitic patients, present the gray pseudo-membranous covering which is seen in secondary syphilitic ulceration of mucous membrane, and am quite willing to admit that they may really have been instances of this form of disease. If the ulcerations which we are examining are not syphilitic, what is their nature? To this question I answer, that they are nearly all, in my opinion, inflammatory?” And again he remarks, “Some few of these ulcerations may be primary or secondary, but the very great majority are merely inflammatory.”

My own observations lead me to differ from the conclusions of M. Gibert and Dr. Bennet. I do not think with M. Gibert that the morbid conditions of the os uteri found in constitutional syphilis are often the direct sequelæ of chancres in the same situation, nor with Dr. Bennet, that these conditions are generally the result of simple inflammation. It appears to me that in almost all cases in which leucorrhœa and disease of the os and cervix uteri are present in women suffering from constitutional syphilis, the uterine symptoms are a genuine manifestation of the constitutional or secondary disorder. The argument derived from the infrequency of secondary syphilitic ulceration upon mucous surfaces, is invalid, since the covering of the vaginal portion of the cervix uteri is more nearly allied to skin than to mucous membrane; and secondary syphilitic disorder is, we know, very frequently met with at the points at which skin and mucous membrane meet. Dr. Bennet remarks, as favoring his views, that “these ulcerations generally gave way easily to the usual treatment—viz., slight cauterization, injections, &c. ;” but, he also adds, that “in all the cases which have come under my notice, the

venereal symptoms were treated at the same time as the uterine." Of course no conclusions could be drawn respecting cases of this kind. It is quite as reasonable to suppose, that the diseased conditions of the os and cervix uteri gave way to the anti-syphilitic treatment, as to the treatment for inflammation. I have, for my own part, seen many cases in which, in patients suffering from disease of the os and cervix uteri, with secondary syphilis, the disease obstinately persisted until it was treated as secondary syphilis. It is not very uncommon to see cases in which men who have had syphilis a few years before marriage convey secondary syphilis to their wives through the medium of the ovum. There is, of course, in such cases a great disinclination to attribute any disorder to a syphilitic taint. In many instances of this kind, I have seen syphilitic leucorrhœa resist all the usual remedies, or if cured by the ordinary means, return again after the disuse of treatment. In some of these cases, the leucorrhœal symptoms have been almost the only signs of syphilitic disease in the mothers, though the nature of the disorder was generally made evident by the presence of syphilitic eruptions upon the children to whom such women had given birth, and by the previous history of the father. Sometimes, however, the children are still-born, and do not present any signs of syphilitic disease, or abortions take place in the early months.

Dr. Ashwell is inclined to follow the opinions of Dr. Bennet. He states: "Judging from my own observation, as well as from the recorded experience of Cullerier, Ricord, and Bennet, there can be no doubt that, although a few of these non-chancrous ulcers may be secondary syphilitical sores, yet that by far the greater number, although found in suspicious connection with the true secondary results of the poison, are really no more than inflammatory ulcerations."

Dr. Whitehead gives the morbid appearances of the os and cervix uteri in twenty-five cases of secondary syphilis, in all of which leucorrhœa and diseased conditions of the lower sequent of the uterus were present, and he relates, with accurate details, seven cases of the same kind. In all these cases the secondary syphilitic manifestations appear to have followed upon primary syphilis in the patients themselves. Dr. Whitehead does not appear to have recognized the transmission of secondary syphilis to the female, through the medium of the ovum, without the previous existence of primary syphilis in the female parent. The following is his definition of the

different ways in which secondary syphilis may appear in the female constitution.

"1st. As an imperfectly cured primary affection, which originally presented itself in form of genuine chancre attacking the external genitals."

"2dly. As the result of virulent inoculation upon the lower part of the uterus, followed by the formation of a sore of a primary character; but which, on account of the scanty supply of nerves which the uterus directly receives from the cerebro-spinal centre, and the low degree of sensibility which is consequently manifested therein under ordinary circumstances, is liable, both at the onset and altogether, to escape observation."

"3dly. As a consequence of secondary inoculation; the affection having lost its primary character in the first individual before being transplanted by contact upon another."

My own opinion is that syphilitic leucorrhœa occurs with certainty only under two conditions.

1. When the patient has contracted primary syphilis, and the secondary or constitutional affection has followed in due course.

2. When the mother, being in health, becomes impregnated by a husband who is at the time affected with secondary syphilis, and receives the secondary syphilitic disorder through the medium of the ovum.

With regard to the direct transmission of secondary syphilis from male to female, and from nurse to child, without the intervention of any primary disorder, I certainly entertain doubts if this can occur. I have never seen a case in which the proof of the occurrence of such a transmission was clear and free from doubt.

M. Ricord, the greatest modern authority in syphilis, believes that when the primary poison is taken, it remains for several days in a state of incubation, during which time the poison may be destroyed, without any danger of the subsequent occurrence of constitutional disease. That after this time chancres take on certain characters, and infect the whole constitution, giving rise to the train of evils known as constitutional syphilis. He does not believe that a sore or chancre, capable of communicating syphilis by inoculation, can ever appear as a secondary symptom. He is of opinion that for the presence of constitutional symptoms it is absolutely necessary that a primary sore should have pre-existed, except under two

conditions—namely, that a man suffering from constitutional syphilis, may impregnate a healthy woman, and the germ may in the first place, have constitutional syphilis, and, in the second, communicate it to the mother, without the existence of any primary disease in either mother or child. Here, I believe, syphilitic contagion stops, in the opinion of Ricord. He does not believe in the communication of syphilis by the secretions, or by the discharges from secondary eruptions or sores. Nor does he believe that a child affected with secondary syphilis can communicate the disease to a healthy nurse, or that a nurse affected with constitutional syphilis can convey the disease to a healthy infant through the medium of the milk.

Other French writers, and some authorities upon the subject in this country, assert, on the contrary, that a man or woman having secondary syphilis may communicate it during intercourse in a direct manner. This is the opinion of Mr. Lane, whose large experience at the Lock Hospital gives great weight to his authority. Some believe that a child having congenital or secondary syphilis, may infect its nurse in the act of sucking, the nurse having been previously free from the disease; and the nurse thus diseased, may become a medium of infection to others; that an infected woman, suffering from secondary syphilis only, may infect a healthy child, through the milk. These are the views held by Dr. Whitehead, in his work on Hereditary Diseases, published in 1851, and by Mr. Rasmus Wilson, in his work on Syphilis, published in 1852. Mr. Wilson goes so far as to assert the identity of gonorrhœa and syphilis, and he is of opinion that all the results of a chancre may follow upon gonorrhœa in which no urethal chancre existed. I differ from these doctrines, but cases are given which are supposed to warrant these views, and the whole question of the transmission of secondary disease is, it must be confessed, in an unsettled state. It will, however, be impossible for any person who pays attention to this subject, not to acknowledge that it is one, the importance of which, both as regards medical science and the physical degeneration of mankind, is much underrated or overlooked.

In the cases of supposed transmission of secondary syphilis between man and woman, there must almost always be the doubt of a new inoculation by primary matter. Indeed, the doubt must be constant, unless we could place implicitly reliance on the truth of all

the parties concerned, and this in such cases must seldom be possible. We might naturally expect that the cases least open to suspicion would be the cases in which a healthy woman suckles a diseased child, or a woman suffering from secondary syphilis nurses a healthy child. Cases of this kind frequently occur under circumstances in which the transmission of secondary syphilis between nurse and child might be expected to occur. Considering the amount of disease and discharge frequently found about the mouths of children suffering from secondary syphilis, it might be supposed that a diseased child constantly sucking a healthy nipple would communicate the disease if it were communicable. Suction ought, one would imagine, to be attended by more danger than sexual intercourse itself. I have frequently sought among such cases for the proofs of the transmission of secondary disorder, but hitherto without success. If I should meet with a case of an opposite character, I shall not fail to record it. I hope I may be excused for relating the following case, which is a remarkable one, and bears upon the point in question.

CASE XI.—*Case bearing on the Direct Transmissibility of Secondary Syphilis, by Secretions or Secondary Sores.*—A woman applied during the course of last year at St. Mary's Hospital, with a nurse-child she was suckling, and she also suckled at the same time a child of her own. The nurse-child was four months old. The skin of its face was like yellow tissue paper; its nostrils and eyes were secreting an abundance of gummy mucus and pus, and the nates and scrotum were covered with erythematous patches in a state of ulceration. Numerous blotches appeared on other parts of the body. The mouth and anus were deeply fissured, and the child's mouth bled every time it took the breast. The woman applied both children to either breast without reservation. When I first saw the diseased child, she had suckled it about a month. The woman herself, and her own child, were at this time free from any obvious signs of disease. The nipples were healthy, although the discharges from the nurse-child's mouth were so acrid, that on the spots where it sucked its own fingers or arms, erythema and ulceration ensued. The nature of the case being evident, the woman was cautioned not to apply her own child to the same breast with the nurse-child, and they were both narrowly watched, during treatment, for many months. In answer to the first inquiries on the

subject, it was stated that the father of the diseased child had the year before been an out-patient at the hospital, under the care of my colleague, Mr. Spencer Smith; and on referring to the hospital registration books, I found he had been treated for an eruption of the leg, which was set down in the register as "probably syphilitic."

The man himself, on being inquired for, gave the following account of himself:—He had contracted syphilis in 1849; a chancre appeared on the prepuce, and remained there three weeks. It was followed by an inguinal bubo. For these symptoms mercury was given him, but he was not salivated. He, however, became apparently well under its use. In 1852, he got his fellow-servant with child, and married her when she was large in the family way. The child—the diseased nurse-child already referred to—was born in January, 1853. From the time of the chancre up to the time immediately previous to that at which his wife fell pregnant, he had observed no signs of any secondary affection. But just before this, he had lost his situation, that of a butler, and, faring worse than usual, he became out of health. His hair now fell off; he had no sore-throat, but an eruption appeared on his legs, for which he was treated by Mr. Smith, and he had a scaly, copper-colored eruption on his forehead, which became very distinct after eating and drinking. He also suffered at intervals from severe rheumatic pains.

The wife remained in apparently good health. She was confined, I believe, in Queen Charlotte's Lying-in Hospital, and was subsequently, there being no sign or suspicion of syphilis, recommended as wet-nurse to a lady living in the country. The husband is in constant communication with his wife, and states that she has given satisfaction as a nurse, and is in good health, with the exception that she menstruates somewhat profusely, and oftener than natural. From his description, it may be suspected that she suffers from secondary syphilitic leucorrhœa. It had not been hidden from the lady whose child the woman is suckling, that the nurse's own child had fallen into bad health.

It became, of course, a very interesting question to determine, as far as possible, whether the diseased child would communicate secondary syphilis to its foster-nurse, and whether the foster-nurse would communicate the disease to her own child or her husband, and also to ascertain whether the mother of the diseased child could communicate constitutional syphilis to her foster-child. Here was

a case in which secondary syphilis might have at once been communicated to at least four persons, besides the parents of the diseased child and the child itself, if we recognize the transmission of constitutional syphilis through the medium of the secretions or secondary sores. In all, six persons were exposed to the danger of syphilis by the intercourse of the father of the diseased child with his fellow-servant. As far as this case goes to the present time, and I have now had it under my observation for many months, it tells very strongly against the communication of secondary syphilis from one person to another, either by means of the matter from secondary sores, or the secretions of a child suffering from secondary syphilis. No case could have been more favorable for such a communication of the disease.

Some time after the child had been under treatment, its foster-nurse had two or three pimples upon her neck, between the breasts; but she stated she had had the same kind of pimples before she began to nurse the foster-child. When she began to confine the diseased child to one nipple, that nipple became sore, and a large serpentine ulcer formed upon it. This healed after being pencilled with nitrate of silver. The ulceration had not, however, the yellow base or other appearances of a syphilitic sore, and three times I performed inoculation with matter taken from this sore, but without any effect. The woman has had no signs of secondary disease in any other part of the body, and is as well as a woman could be expected to be who has suckled two children. Her own child is perfectly free from all signs of disease, and so is her husband, at the present time. I purposely limited the treatment to the diseased child itself, so that I might observe the condition of the nurse purely and simply.

The state of the mother of the diseased child is perhaps suspicious, as menorrhagic losses are among the most common signs of secondary syphilis in the female; but still it is frequent in wet-nurses who menstruate during lactation. I have made inquiries, and cannot learn that the child she has suckled shows any signs of disease. It is fat and healthy, and although the suspicions of the mother of the child have been excited, she appears perfectly satisfied with the health of the nurse. Thus, as far as this case goes, the syphilized father, in the first instance, begot a diseased child. The mother suffered slightly, if at all, and has not communicated disease to her

foster-child. The syphilitized child has not communicated disease to its foster-mother, and father, or to its foster-brother, though it would be difficult to conceive a mouth in a more aggravated state of disease, than was the mouth of this child when I first saw it. The eruption and other signs of disease were relieved by gray powder, a mercurial girdle, the iodide of potassium, and cod-liver oil.

This case shows the amount of disease which may follow marriage where the husband has had syphilis previously, and where only slight signs of the disease remain in his constitution.

In private practice in this country, the most common mode in which syphilitic leucorrhœa of a secondary character occurs is where the husband has had syphilis before marriage, and is liable to occasional outbreaks of secondary or tertiary disorders. In such cases the ill health of the wife generally dates from the first three or four months of pregnancy. Sometimes she has other secondary manifestations, such as alopecia, sore-throat, and cutaneous eruptions. In others, leucorrhœa is the chief noticeable symptom. We know that in such cases, the ovum is frequently diseased, the membranes are unhealthy, or the foetus is affected with secondary syphilis, or specific eruptions break out within a few weeks after birth. We cannot wonder that in such cases the mother becomes diseased, for by means of the foetal circulation, the blood of the male parent is brought almost as directly into contact with the female as though a tube was placed between the vessels of the two parties, and the circulating fluid allowed to interfuse. Generally, both mother and child are affected; more rarely, the mother is affected and the child remains healthy; and cases occasionally occur in which a mother bears a family of children by a husband suffering from secondary disorder, all of whom are unmistakably diseased, while she herself escapes apparently with perfect impunity. I believe I have seen cases in which syphilis has caused the death of the mother, or permanent loss of health, while the child remained unaffected; and I am sure I have seen cases in which many children have been destroyed, the mother remaining pure. Women imbued with the syphilitic poison frequently bear large families; but I have seen cases in which, apparently without any other cause than the syphilitic taint, permanent sterility has followed upon the pregnancy which occasioned the infection. When the mother is once affected, and no treatment is resorted to by the husband, a fresh dose of the secondary poison is imparted at

each pregnancy. As regards the length of time after an attack of primary syphilis, during which a man may beget a diseased ovum, it is difficult to give a positive opinion. It is more a matter of temperament and constitution, than of years. Some habits throw off the syphilitic poison readily, and to all appearance completely; others retain it for a long course of time. It adheres, *cæteris paribus*, less tenaciously to the constitution in youth, than when the disease has been contracted during mature manhood.

The appearances presented by secondary syphilitic leucorrhœa, do not differ materially from the appearances presented in other severe cases of leucorrhœa. It is this circumstance which has probably led to its doubtful recognition as a form of secondary syphilitic disorder. Its chief characteristics are, its existence in connection with frequent abortions, and with other secondary symptoms, and the difficulty experienced in its cure, except by anti-syphilitic remedies. In secondary leucorrhœa, the cervix uteri is generally soft, swollen, injected, and entirely denuded of epithelium. It hangs loosely in the vagina, from the weakening of the vaginal walls. Eruptions are often met with in the upper part of the vagina, and upon the external portion of the cervix. The os uteri often gapes so as to exhibit the rugæ of the lower part of the cervix; and a thin yellow purulent matter, which when mixed with the morbid secretions from the cervical canal, looks something like honey or honey and water, exudes in considerable quantity from the lower part of the uterus. Occasionally, warty growths are found upon the os uteri, and the vesicles of Naboth are sometimes present at the os uteri. The amount of discharge in such cases is frequently very great.

I have always been of opinion, that there is a large amount of undetected syphilis in the works of Dr. Whitehead and Dr. Bennet. In the worst cases of leucorrhœa combined with successive abortions, detailed by Dr. Whitehead, the patients did not recover without the use of mercurials and the ioduretted sarsaparilla. I form my opinion of Dr. Bennet's cases from the evidence contained in the cases themselves, and from the circumstance that the patients I am in the habit of seeing at St. Mary's Hospital, belong to the same class as those who attend at the Western Dispensary, and whose cases were in great part the basis of Dr. Bennet's volume. Patients frequently migrate from one institution to the other, and

it has occurred to me on several occasions to have as out-patients women who had formerly been at the Dispensary, and in whom I have been able distinctly to trace a syphilitic taint. I have already stated that, according to my experience, the cases of disease of the os and cervix uteri, in which repeated abortions occur, are more frequently cases of secondary syphilitic leucorrhœa, than of simple non-specific inflammation of the cervix uteri. A reference to the origin of this latter doctrine, which lays it down that such cases are dependent upon simple inflammatory ulceration, will, I believe, strongly support my views upon this subject. To show this I proceed to quote the following passage from Dr. Bennet's observations upon the subject :—

" My attention was first drawn to inflammatory ulceration of the cervix uteri in pregnant females by M. Boys de Loury, one of the physicians of St. Lazare, an hospital-prison of Paris, where women of the town laboring under syphilis are confined and treated. The speculum being used with all the patients, as a means of exploration (with those who are pregnant as well as with those who are not), M. Boys de Loury thus discovered that ulcerative inflammation of the cervix is not uncommon in pregnant women, and that when left to itself it frequently occasions abortion. I believe that I am authorized to attribute to M. Boys de Loury this great discovery, as I certainly never heard any other practitioner allude in the most cursory manner to this subject, and I am not acquainted even with a writer respecting it in the entire range of medical ulceration."

Thus, it was among pregnant prostitutes confined in a prison-hospital, and suffering from syphilis, that inflammation and ulceration of the lower segment of the uterus during the pregnant state, was first observed. It certainly appears to me that Dr. Bennet, in referring such conditions to simple inflammatory disease of the cervix uteri, has not given them their true significance. I believe that all the facts relating to the matter, point, in a large proportion of cases of leucorrhœa with repeated abortion, to secondary syphilis as the cause, and not to simple inflammatory disorder of the cervix uteri. In such cases the condition of the os and cervix uteri, and the leucorrhœa, are not of so much importance as the constitutional taint. I do not mean to say that cases of non-syphilitic leucorrhœa accompanied by repeated abortions do not

occur, for I shall have to relate some such cases; but I believe they are rare when compared with the frequent occurrence of abortion in cases of secondary syphilitic leucorrhœa. There can, I think, be no doubt, that in all cases of leucorrhœa with repeated abortion, or still-births, or cases in which the child dies shortly after birth, the health of the male parent before marriage should be strictly inquired into. Such cases are always suspicious if the man should have had syphilis before his marriage, and particularly if, after marriage, he has been troubled with any of the signs of secondary or tertiary syphilis.

The following cases may be related as illustrations:—

CASE XII.—Case of Secondary Syphilitic Leucorrhœa, the Result of Pregnancy in which the Ovum was diseased.—Mrs. —, aged twenty-five, married, consulted me in 1852, for leucorrhœa and menorrhagia. She had aborted several times, and was in very bad health. The digestive organs were much damaged. She complained of palpitation and violent headache, apparently the results of loss of blood. Pain in the lower part of the back quite disabled her from walking, and she suffered from constant bearing-down and uneasiness in the regions of the uterus and bladder. She referred her maladies entirely to three abortions, and to menorrhagia following upon them. For three years she had menstruated profusely and irregularly, and with considerable pain, and at each abortion she had lost a large quantity of blood. The leucorrhœa was constant and profuse. On examining digitally, the uterus was found prolapsed almost to the ostium vaginalis. On making an examination with the speculum, I found the whole of the os uteri and the upper part of the vagina, excoriated and devoid of epithelium; the entire cervix was enlarged, and bled upon the slightest pressure. An eczematous eruption was visible upon the os uteri, and the orifice was deeply fissured. Pus was secreted in considerable abundance by the abraded surfaces, and large quantities of yellow viscid mucus poured from the cervical canal. This patient remained in London about three months, and under the administration of alteratives and tonics, with local treatment, the uterus returned to a tolerably healthy condition. The leucorrhœa ceased, she menstruated naturally, and became comparatively strong. During this time I had little, if any, suspicion of the syphilitic taint. There

were no symptoms, in fact, which could not be explained by the abortions and their results, occurring in a person of not very robust constitution. The abortions themselves appeared to have been caused by the diseased condition of the os and cervix uteri. She now went into the country, and became pregnant for the fourth time. She lost blood occasionally during this pregnancy, and aborted at the fifth month. When I was made aware of this, I begged that, if she aborted, the placenta might be sent to me. She did abort, but I did not see the placenta, as the gentleman in attendance considered it healthy. There appeared to be no signs of placental disease, but after this abortion all her old symptoms returned, and she again applied to me. She now complained of ache of the face and neck, sore-throat, and pains in the frontal bone; circumstances which led me to inquire into the case more closely, with a view to ascertain the existence or non-existence of a syphilitic taint. All the parties concerned showed the utmost candor, and with the aid of the medical attendant, a distinguished provincial surgeon, I obtained the following syphilitic history:—

The husband, in 1842, nearly eleven years ago, had a chancre, for which he was salivated. He subsequently passed through secondary symptoms, had sore throat and eruptions, for which he took a course of iodine and sarsaparilla, after which he considered himself, and was pronounced perfectly cured. He still, however, occasionally had aphthous ulceration of the mucous membrane of the mouth, and a few spots of acne on the face, but his health was considered uniformly good.

In June, 1848, not suspecting any syphilitic hazard, he married, his wife being at that time in good health. Nothing unusual occurred until she became pregnant, about two months after her marriage. She stated that her illness did not begin until after she became pregnant. At the end of January, 1849, she miscarried at the sixth month. She again became pregnant at the beginning of 1850, and was delivered prematurely in September, the child living some hours. She became pregnant a third time in the spring of 1851, and aborted at the eighth month, in August, 1851, the child being born alive, but dying almost immediately. After each of the first three pregnancies her health became worse than before. Occasional floodings occurred during the course of each pregnancy. The three foetuses born at the sixth and eighth months respectively were well-formed, and free from

external signs of disease. Nothing unusual was observed in the placenta, but no exact examinations were made. Her fourth pregnancy began in June, 1852, and she miscarried in the third month, in August of the same year.

In this case, a husband, in such good health as to escape observation, impregnating a woman also in good average health, led to the destruction of four foetuses, and the saturation of his wife's constitution with secondary syphilis. It appeared to be evident in this case, that the poison was conveyed to the mother by the ovum. She was healthy until her first pregnancy began, and she became worse after each successive gestation. This patient permanently improved in health under a mild mercurial course, and the husband was placed under a similar treatment by his medical attendant. No other signs of the syphilitic poison were present in the first instance except the abortions and the leucorrhœa and menorrhagia. It might very well have been mistaken for simple inflammatory disease, but the history of the case, and the effects of ordinary, and of anti-syphilitic treatment, leave no doubt, that the leucorrhœa, and the morbid state of the os and cervix uteri, were dependent upon constitutional syphilis.

CASE XIII.—Case of Secondary Syphilitic Leucorrhœa of Sixteen Years' Duration.—The following case I saw in consultation with a physician and surgeon of eminence. Mr. —, during his wife's lying-in, contracted syphilis. He had a chancre, which was promptly attended to, and he was passed through a mild mercurial course. His medical attendant pronounced him, after six weeks' treatment, free from disease, and he returned to his wife's bed. In a short time she became pregnant, but miscarried during the early months. Two or three other abortions followed in quick succession. The wife then bore two children at the full term, but they were both the subject of eruptions from a short time after birth, and one of them, a girl, had a vaginal discharge, which lasted up to the time of puberty. In the mean time, the husband passed through the usual symptoms of constitutional syphilis, but in a very mild form. He had sore throat and syphilitic eruptions, both of which recurred occasionally for many years.

Previously to the contraction of syphilis by the husband, the wife had been perfectly healthy, and she had borne healthy children, but she dated her declining health from the time of the abortions. She

suffered during many years from leucorrhœa, and occasionally from menorrhagia ; and when I saw her she had a papular eruption upon the os uteri, with profuse cervical discharge. She was, moreover, blind from syphilitic amaurosis, and she was paralyzed in both her lower extremities. In the early part of her illness she had suffered from sore throat, eruptions upon the skin, and had lost her hair and eyebrows. The case was a very distressing one, and as its real nature became unravelled, the husband persisted in refusing to believe such protracted mischief could have depended upon his former infection. The entire circumstances were laid before M. Ricord for his opinion, who hesitatingly referred the whole train of evils to constitutional syphilis, conveyed to the wife during her pregnancies.

The patient was not treated, her relatives persisting in the belief that so much havoc could not possibly have been produced by the cause assigned. In this case uterine symptoms depending upon constitutional syphilis had lasted nearly twenty years. The leucorrhœa was described as coming on occasionally in outbreaks, and then as being more moderate at intervals, but during the whole time she was never entirely free from leucorrhœal disorder.

CASE XIV.—*Secondary Syphilitic Leucorrhœa, the result of impregnation by a husband suffering from secondary syphilis.*—Mr. —— contracted a chancre in 1835, which remained indurated for three or four months. During this time he took a large quantity of mercury, but he was never perfectly salivated. He has not had sore throat, but during the years 1836–7 he suffered from rheumatism, and occasionally suffers rheumatic pains up to the present time. In 1843 he lost his hair and eyebrows. He was never treated for secondary syphilis. In 1843, Mr. —— had gonorrhœa, followed by a gleet for four or five months; but there was no suspicion of chancre at this date. He married in 1845. His wife did not become pregnant till 1850, when she miscarried in the fifth month. She stated that up to the time of her pregnancy she enjoyed moderately good health, but she had not been well since. Her complexion is sallow, she is anaemic, and has a profuse cervical leucorrhœa. The os and cervix uteri are denuded, and the upper part of the vagina is in an aphthous condition. Her husband is anaemic, and is occasionally troubled with eruptions and sore throat. My suspicions respecting the syphilitic taint in the wife were caused by observing that the leucorrhœa and

the spotted condition of the os uteri frequently reappeared after it had been apparently cured. This patient became well under the use of a mild mercurial course, and the ioduretted sarsaparilla, with the same local treatment which had previously failed. There could be little doubt that in this case the syphilitic taint was conveyed to the mother through the medium of the ovum in the single pregnancy which occurred.

CASE XV.—*Secondary Syphilis the Result of Pregnancy.*—The subject of the following case was for several months under my observation as an in- and out-patient of St. Mary's Hospital. E—R—, aged twenty-six, the wife of a cabman, was admitted into the Boynton ward, April 6th, 1853, suffering from pelvic inflammation. She had been delivered three weeks before of a living child. Both herself and the child were affected with secondary syphilis, the history of which was as follows: Her husband five years ago had a chancre, for which he was treated at the Lock Hospital. At the time of his marriage he had no signs of secondary syphilis beyond a few spots of acne upon his forehead. He had previously suffered occasionally from sore throat and rheumatic pains in his limbs. His wife was at the time of her marriage in perfect health. Three months afterward she became pregnant, and in the latter months of gestation suffered from an eruption upon the vulva. After the birth of the child, she had syphilitic eruptions upon the skin, sore throat, and her hair fell off, so that the front part of the head became nearly bald. The os uteri was also in an aphthous condition, the cervix swollen and denuded, and pouring out large quantities of sanious pus and mucus, both from the canal of the cervix and its vaginal portion. The child was healthy at birth, but when a fortnight old became affected with fissures of the mouth and anus, gummy discharges from the eyes and nose, erythematous, patches upon the nates, which passed into ulceration, and it died of syphilis and want of breast-milk, at the age of six weeks. After remaining some time in the hospital, the mother became an out-patient, and the principal symptom of secondary syphilis was the profuse leucorrhœal discharge, which only diminished after a mild mercurial course. In this case there could be little doubt that the syphilis in the mother was entirely of a secondary character.

Since my attention has been directed to this subject, I have seen

a considerable number of cases of aggravated leucorrhœa, in which the leucorrhœal disorder evidently depended on secondary syphilis. They were characterized by denudation of the os uteri, fissures, profuse yellowish discharge, consisting of pus and mucus corpuscles, and eruptions of the os and cervix. In many cases in which abortions are thought to be caused by leucorrhœa and the condition of the os and cervix uteri, I am convinced the real source of disease is the secondary poison of syphilis affecting the ovum, and the mother through the ovum. I am also convinced that syphilitic leucorrhœa is, in the female subject, almost as common a manifestation of secondary syphilis as sore throat.

In the cases I have narrated, the mothers contracted secondary syphilis from the ovum, without having been the subjects of primary syphilis. I have the notes of several cases of primary syphilis in the female, in which syphilitic leucorrhœa was a prominent symptom of the secondary affection; but far more commonly, women who become mothers are infected with secondary disease through the medium of a syphilitic ovum. In the following case, secondary syphilitic leucorrhœa occurred in a patient who had been the subject of primary syphilis.

CASE XVI.—Secondary Syphilis following upon the primary disorder in the same individual.—E—B—, the second patient admitted under my care at St. Mary's Hospital, after the opening of the hospital in 1851, was a case of leucorrhœa depending upon secondary syphilis, she herself having been the subject of primary syphilis. She had contracted the disease seven years previously. Four years from that time she had a child, who died soon after its birth, and one year before her admission she was treated at St. George's Hospital for secondary sore throat. She had, during the whole time, suffered from leucorrhœa, and about three months before her admission she became affected with procidentia uteri in consequence of severe exertion. It was for this affection she came into the hospital. When admitted, there was a profuse yellow discharge from the canal of the cervix, the os uteri being completely abraded, and the os and cervix uteri soddened in appearance. She had sore throat, her hair was falling off, and the mucous membrane of the nares was thick and irritable. The amount of discharge from the vagina after the reduction of the procidentia was immense. At

this time I did not recognize the syphilitic taint, and its influence on the leucorrhœa, so distinctly as I have since done in similar cases ; and during her stay in the hospital, I only gave her alternative and tonic medicines, with an occasional mercurial. With these, rest, and good living, she became much better, and left the hospital in tolerable health. But she reappeared as an out-patient shortly afterwards with a return of the leucorrhœa, when I put her through a mild mercurial course with ioduretted sarsaparilla, and she became quite well.

CHAPTER VII.

THE RELATIONS OF VAGINAL OR EPITHELIAL LEUCORRHœA TO
GONORRHœA IN THE FEMALE; TO URETHRITIS IN THE MALE;
AND TO THE OPHTHALMIA OF NEW-BORN INFANTS.

THE relations between leucorrhœa and gonorrhœa are well deserving of attention, and I do not think the subject has been exhausted by the most recent writers on uterine disease. Dr. Bennet makes no allusion to gonorrhœa as a cause of leucorrhœa, though I have no doubt many of his dispensary cases were of gonorrhœal origin. Dr. Ashwell describes gonorrhœa in women as having its chief seat in the vagina. He remarks, "In women, the vagina and not the urethra is the chief seat of the disease," but he also states that, "if the internal parts are examined by the touch, they will be found tender, swollen, and more or less bathed in discharge. If the speculum be used, it will bring to view different conditions of the cervix, dependent on the different intensity of the poison, the susceptibility of the patient, and the neglect or care with which the affection has been treated. In a great number of cases the cervix will be found simply inflamed, as evidenced by redness and a polished surface; in others, erosions will be seen of varying extent, and in the worst cases, I have often perceived herpetic pustules on the cervix, and particularly about the os, which by bursting have formed ulcers. Sometimes the follicles on the surface of the cervix, and the glandulæ Nabothi, participate in the inflammation, and become much swollen and enlarged." I quite agree with Dr. Ashwell, when he considers the vagina the common habitat of gonorrhœa; but it appears to me that his description of the state of the os and cervix uteri applies much more correctly to secondary syphilitic leucorrhœa, than to leucorrhœa having a gonorrhœal origin.

Dr. Whitehead differs from Dr. Ashwell in his opinion respecting the seat of gonorrhœa. The following is Dr. Whitehead's descrip-

tion of this disorder. "Gonorrhœa in the female is much more frequently an affection of the uterus than the vagina. This, although totally at variance with the opinions hitherto entertained, is nevertheless what might reasonably have been anticipated. In the first place, the gonorrhœal virus, from physiological causes, is liable to be carried immediately to the highest part of the canal, and forcibly projected upon the lower extremity of the uterus, which organ also at this juncture is in a state eminently calculated speedily to absorb it; in the second place, the normal secretion of the vagina possesses properties which are capable, to a certain extent, of destroying, or of materially modifying the virulence of the morbid product, and of thus protecting the vaginal surface from its immediate influence. The urethral orifice, however, seems to be provided with this means of protection in a much less perfect degree, and is, therefore, more highly susceptible of the action of specific inoculation. In nine unimpregnated women afflicted with gonorrhœa, seven had inflammation, with abrasion of the labia uteri, and in the remaining two, the inflammatory action was confined to the vaginal surface; the parts beneath the arch of the pubis being severely affected; in one of these the urethral orifice was also involved. The first change operated upon the uterus after gonorrhœal inoculation, consists in superficial inflammation of one or both labia at their most depending part, or at the boundary of the os and commencement of the internal cervix."

When speaking of the relations which exist between secondary syphilis and the form of leucorrhœa which attends it, I pointed out my reasons for believing that Dr. Whitehead has not drawn the line distinctly between simple leucorrhœa and the discharges of secondary syphilis; and I would here remark, that as far as my experience has gone, his description of gonorrhœa applies to the chronic rather than the acute stage of this disease. He himself observes that "females affected with gonorrhœa seldom present themselves for treatment during the acute stage of the complaint." This leads me to suppose, that he may possibly have taken his description from cases seen a considerable time after infection. In my experience of such cases, the phenomena described by Dr. Whitehead, belong to chronic rather than to acute gonorrhœa.

It appears to me that there is a large amount of undetected syphilis in the works of both Dr. Whitehead and Dr. Henry Bennet.

I also strongly suspect Dr. Whitehead to have confounded syphilitic and gonorrhœal leucorrhœa together. At least the symptoms he attributes to gonorrhœal leucorrhœa, such as eruptive conditions of the os uteri, abortions, chronic purulent discharge, fissured ulceration and induration, I have generally met with in cases of undoubted syphilitic leucorrhœa. In the following case, for instance, which Dr. Whitehead cites as one of gonorrhœal leucorrhœa, I should be more inclined to refer the symptoms to syphilis than to blennorrhagia.

“One patient, forty-five years of age, laboring under disordered menstruation and purulent leucorrhœa, had been from time to time, a patient of first one, then another of the hospitals, and frequently under the treatment of private practitioners for the ‘whites,’ during a period of more than twenty years. She contracted a gonorrhœa from her husband shortly after marriage, in her twenty-second year, for which she was under treatment at that time for three or four months; her complaint was considered perfectly cured, although the yellow discharge did not cease, but was present ever afterwards, except during the menstrual terms. She miscarried of her first pregnancy before the period of quickening, and had subsequently several ‘false conceptions,’ which were not looked upon as pregnancies. In all, according to her own reckoning, she had had fourteen pregnancies, seven of which terminated at, or within six weeks of the full period. The children in all of these instances were born alive, but all died emaciated in infancy, several of them having had purulent ophthalmia. The rest were abortions, in the sixth month of pregnancy. I found the cervix uteri deeply fissured and indurated, the labia excoriated; and there was an abundant muco-purulent discharge, with great constitutional disturbance. She was more than five months under treatment, during which time the system was once brought under the influence of mercury, and she took during the whole of this period the compound decoction of sarsaparilla, combined with iodide of potassium. Her ultimate recovery was most satisfactory.”

I should consider the duration of the disease in this case, the death of so many children, the occurrence of so many abortions, the condition of the os and cervix uteri, and above all, the good results of treatment (after the failure of other methods) by mercurials and the ioduretted sarsaparilla, abundantly sufficient proof that this case was

one of syphilitic leucorrhœa ; the leucorrhœa occurring as the constitutional manifestation of the syphilitic disease. I have no doubt whatever, that in the large mass of valuable cases contained in Dr. Whitehead's work, there is a great amount of latent syphilis of a secondary and tertiary kind ; and indeed he himself states that,— “ In a vast proportion of the cases of simple erosion of the fissurated ulcer, as well as of inflammation of the deeper seated textures, met with in the course of these investigations, the origin of the complaint was attributed by the patient to the “ bad disorder.”

In the cases of gonorrhœa which have come under my observation shortly after the first outbreak of the symptoms, the disease has consisted of intense epithelial vaginitis, involving the meatus urinarius, and the discharge has been made up of scaly epithelium, plasma and purulent matter. The os and cervix uteri I have found to be seldom affected in recent cases. When gonorrhœa has existed some time, I have found vaginitis to exist in combination with inflammatory disorder of the vaginal portion of the cervix and the cervical canal, and the discharge has then consisted, upon microscopical examination, of epithelial scales or epithelial masses, mixed with pus- and mucus-corpuscles. In other cases, chiefly of long standing, the vaginitis had disappeared, and the diseased conditions have been confined to the os and cervix uteri, and the discharges have resembled the secretions in non-specific cervical leucorrhœa. This latter condition may, I believe, remain for years after an attack of acute gonorrhœa.

Urethritis in the Male, caused by Epithelial Leucorrhœa.— Cases are sometimes met with in practice, in which all the symptoms of gonorrhœa occur in the male, after intercourse with a woman affected with leucorrhœa only. No doubt in some of these cases, gonorrhœa may have existed in the female, but they occur so often as to leave, I think, little question that under certain circumstances, a spontaneous leucorrhœa arising independently of sexual intercourse, may produce urethritis and inflammation of the glans penis in the male. The urethritis thus caused can scarcely, if at all, be distinguished from gonorrhœa, the result of infection. What are the circumstances under which the female discharges become capable of exciting acute disease in the male organs ? I do not know that this subject has ever been investigated with precision, and it is one surrounded by many difficulties. There has been a

common tendency to refer to purulent discharges from the os and cervix uteri as the source of irritation in such cases; but cases are met with in which, as in the progress of cancer, for instance, the discharges are apparently more irritating than under any ordinary circumstances, yet intercourse may continue to a late period of the disease without exciting any irritation in the male. In some case of painless, or almost painless cancer uteri, women apply to hospitals with the os and cervix uteri far advanced in ulceration, who have been living with their husbands without any suspicion of being the subjects of serious disease. If purulent or simply irritating discharges from the uterus were the cause of the affection simulating gonorrhœa in the male, we might imagine it would be found in such cases as those now referred to. Again, in cases of extensive disease of the os and cervix uteri, of a non-malignant character, where profuse purulent discharge exists, urethral disorder in the male is rarely produced. It has been remarked that the mischief generally arises in cases of leucorrhœa which do not exhibit any unusual severity, and it has therefore been supposed by many that it must depend, not so much upon the female discharges, as on some peculiar susceptibility in men who become affected in this manner. It appears to me that in accounting for these phenomena the condition of the os and cervix uteri has been too generally considered, instead of the state of the vagina, and that we must look to the vagina for the true explanation.

It is well known that the great modern authority, M. Ricord, is of opinion that gonorrhœa is simply an inflammatory affection, accompanied by a highly acrid and irritant discharge, and that it occurs quite independently of any specific source of infection. He believes that when it arises after sexual intercourse, no specific poison exists, but that the same identical affection of the urethra and glans penis may be produced by mechanical and other injury of these parts. I need not say that it will favor the views of M. Ricord, if we can trace any similarity between the condition and discharges of the vagina in what is commonly considered infectious gonorrhœa, and that form of the disease arising after intercourse with a woman affected with a leucorrhœal discharge only.

In gonorrhœa, the first symptoms of the disorder are referable to the vagina and the urethra, and the anterior wall of the vagina has been particularized as the especial seat of inflammation. The

os and cervix uteri, the fundus uteri, Fallopian tubes, and the ovaria, become inflamed in some cases, but I believe only as an extension of the disease from its first seat in the vagina. We meet also in practice with cervical leucorrhœa in women who have suffered from gonorrhœa, long after vaginal inflammation, and the urgent symptoms of gonorrhœa, have disappeared. This form of cervical leucorrhœa appears analogous to gleet in the male, but it does not differ from cervical leucorrhœa originating in other ways. Let us now inquire what are the conditions of the utero-vaginal membrane and its discharges in gonorrhœa in the female, and in those cases of leucorrhœa capable of exciting irritation in the male organs, respectively? I cannot offer a large number of cases, but those I have observed, seem to throw some light upon the subject:—

CASE XVII.—*Acute Gonorrhœa, the Result of Infection.*—A young unmarried woman, a domestic servant, presented herself as an out-patient, suffering apparently from leucorrhœa. She complained of dragging pain in the lower part of the back, heat in the vagina, and difficulty and pain in making water. On examination, she was found to be suffering from vaginitis, with profuse discharge from the vaginal surface. The os uteri was red and tender, but no discharge issued either from the canal of the cervix, or from the surface of the os uteri. She stated that she had borne a child four years ago, and admitted that she was accustomed sometimes "to see a friend." The discharge appeared almost suddenly, a few days after intercourse, and she acknowledged that she knew it was gonorrhœa which had been communicated to her. I took a small portion of the discharge from the vagina for microscopical examination, and it consisted of pus-corpuscles, with a profuse quantity of epithelial desquamation and epithelial débris; it was distinctly acid. In this patient, the gonorrhœa subsided without extending to the os and cervix uteri, but she has since suffered from inversion of the vagina and prolapsus uteri, depending upon debility of the vaginal walls, a result which very frequently follows upon epithelial vaginitis.

CASE XVIII.—*Acute Gonorrhœa, the Result of Infection.*—The following case of gonorrhœa, the result of infection, I saw with Mr. Ballard, of Southwick Place. The subject of it was a girl aged

twenty, in whom the symptoms of gonorrhœa came on only two or three days before. On examination, the meatus and the whole of the vagina were of a deep red color. The inflammation did not, however, extend to the os and cervix uteri, which were pale and natural in color. The whole of the surface of the vagina was smeared with a thick, opaque discharge. When examined microscopically, it was found to consist of fat-globules, pus-corpuscles, and an abundance of scaly epithelium, in all stages of development. The vaginal secretion, notwithstanding the presence of pus, was highly acid. In this case, the gonorrhœal inflammation was limited to the vagina, the os and cervix uteri remaining unaffected. All the symptoms of gonorrhœa in the female, fever, lancinating pain in the vagina, excessive scalding in making water, and pain on evacuating the bowels, were present in a high degree. As regards the microscopical and chemical characters of the discharge, it would have been impossible to distinguish between this case, and any case of vaginal or epithelial leucorrhœa, not the result of contagion.

CASE XIX.—*Gonorrhœa occurring during Pregnancy.*—A patient was sent to me by an eminent surgeon, in 1851, in the sixth month of pregnancy. She had, some weeks before I saw her, contracted gonorrhœa. She complained of dysuria, constant pain in the vagina and in the course of the urethra, and profuse leucorrhœa. On making an examination with the speculum, the meatus urinarius, the whole of the vagina, and the vaginal portion of the cervix, were in a state of inflammation. A plug of thick mucus hung from the cavity of the cervix, and a profuse discharge covered the walls of the vagina. Examined with the microscope, the vaginal portion of the discharge was found to consist of immense quantities of epithelial matter, in single scales, of every size from mere nuclei upwards, and of flakes of epithelium in masses. On one occasion this patient brought a tumblerful of these flakes, mixed with a little water. The vaginal discharge was distinctly acid. The plug of mucus hanging from the os uteri consisted of the usual elements—plasma and mucus-corpuscles. She became well before her delivery, and her child was not affected with ophthalmia. In this case the gonorrhœal inflammation extended to the cervix uteri. There was no question about the gonorrhœa. The patient was a kept woman, and during the absence from town of the

gentleman who cohabited with her, she had contracted gonorrhœa, which she communicated to him on his return. In this case there was not only vaginitis, but an inflamed condition of the canal of the cervix, with profuse epithelial and mucous discharge. From the symptoms, however, I think it probable that the irritation extended from the vagina to the cervix uteri, after the vaginal portion of the gonorrhœa had been some time in existence. From these cases, it would appear that epithelial vaginitis is the chief appreciable result of gonorrhœal infection in the female.

In the next two cases, symptoms resembling gonorrhœa in the male were excited by intercourse with women, the subjects of simply vaginal or epithelial leucorrhœa. I have seen similar cases in hospital practice; but I have selected those which follow, as occurring in private patients, and where the existence of gonorrhœa from infection was not suspected.

CASE XX.—*Epithelial Leucorrhœa, communicating obstinate Urethritis.*—A married lady, aged twenty-five, was sent to me by Mr. Avery, under the following circumstances: she was married at eighteen, and remained in good health for two years, when she miscarried at the fifth or sixth month, and since then she had been out of health. A year and a half ago she became the subject of leucorrhœa accompanied by heat and pain in the uterus and vagina, and pain during micturition and defecation. At this time her husband became the subject of urethritis, as he declared, from intercourse with his wife. The gleet and leucorrhœa were cured, but at the end of 1852, this lady suffered from another acute attack of leucorrhœa, which as before was followed by blennorrhagia in her husband. On examination, I found the vagina inverted to a considerable extent, and the os uteri prolapsed so as to be within an inch of the vulva when she stood in the upright position. The os and cervix uteri were perfectly healthy. There was no abrasion of the surface nor was there any excessive secretion of the follicles of the cervical canal. The surface of the vagina was red and injected, the papillæ being very evident, and the whole canal was smeared with a discharge, consisting of mucus, and pieces of skin-like matter, resembling the lining membrane of the shells of eggs, to which she herself compared it. Some of these pieces were an inch in diameter. Under the microscope, the mucus consisted entirely of epithelial

particles and plasma; and the large pieces were dense layers of epithelium. The whole secretion was intensely acid. There were no signs of urethritis in this case. I believe I can depend upon the truthfulness of the parties, and that there was no possibility of gonorrhœa, and no other source of the disorder than a spontaneous epithelial vaginitis, which excited urethritis in the husband.

CASE XXI.—*Epithelial Leucorrhœa communicating Balanitis, and accompanied by scanty and difficult Menstruation.*—I saw the subject of the following case with a gentleman in the country, in December, 1852. A lady, twenty-seven years of age, had been married three years. Up to the time of her marriage she had menstruated regularly and pretty freely. Ever since her marriage, although experiencing the ordinary symptoms, and suffering acute pain, no catamenial secretion appears beyond a few drops for the first day or two of her monthly illness. After this she appears to suffer from local inflammation, which, with or without remedies, lasts a few days, when she rallies and waits for the next attack. About six months before I saw her, the os uteri had been dilated by instruments, and though she suffered a good deal at the time, she was better for two or three months after. There was some reason for suspecting her to have been pregnant at this time, and she went to Italy, where she had a sharp illness, and was supposed to have aborted. On examination, I found the uterus very low in the pelvis, as it generally is in young women who have been the subjects of vaginitis. The vagina was florid, and a good deal of shreedy matter was found upon its surface. These shreds she described as being constantly passing from her. The shreds consisted of masses of scaly epithelium which had been detached from the vaginal walls. On two or three occasions the husband of this lady had suffered from balanitis, but there was no suspicion whatever of any source of irritation or contagion, except that depending upon the chronic vaginitis, from which the wife had suffered. The vaginitis was no doubt caused, in the first instance, by sexual intercourse, and was itself probably the cause of the difficult and scanty menstruation.

For the next case, which is a highly interesting one, I am indebted to my friend, Mr. T. W. Nunn :—

CASE XXII.—*Epithelial Leucorrhœa, occurring during Preg-*

nancy, and communicating repeated attacks of Balanitis.—“A gentleman, who had been married about two years, applied to me with severe balanitis (gonorrhœa preputialis). Previously to his seeking my advice, he had employed various astringent lotions, and on one or two occasions sulphate of copper in the solid form, without permanent good result. At the time when the affection first showed itself, his wife was four months pregnant, and had become the subject of a discharge, which was described by him as resembling thin white paper half chewed; this was frequently very profuse, and occasionally gave rise to a slight scalding on her passing water. Whatever means were employed to get rid of the balanitis were invariably frustrated by a repetition of coitus. It must be stated, however, that even during periods of abstinence for two or three weeks, the advance towards cure was but slow, the prepuce being with great difficulty drawn back, and the patient refusing to allow of its being slit up. On testing the secretion of the wife's vagina with litmus paper, it was found to be intensely acid, the intensity being inferred from the rapid and decided change of the blue to red. This acid epithelial discharge continued during the remainder of her pregnancy, and for some two months after confinement; tonic medicines, exercise, and injections of cold water, having been prescribed by the physician who attended her. The leucorrhœa at length disappeared, and with it the last trace of the husband's balanitis. There was at no time a discharge from the husband's urethra; neither were there any symptoms of stricture. By the way, he stated that upon penetration, the acrid secretion of the vagina instantaneously produced severe smarting of the penis. I suggested the employment of soap and water, made additionally alkaline by bicarbonate of soda, as an injection into the vagina, but with not much effect in preventing for more than two or three hours, the corrosive effect upon the mucous membrane of the glans and prepuce.

“Although in this case there was, as stated, no urethral discharge, I think there can be no doubt of the possibility of so-called leucorrhœal discharge producing urethritis in the male, but not of a very obstinate character. I am inclined to believe that when urethritis is produced in this manner, it makes its appearance immediately after connection,—that is to say, within twelve or fourteen hours. On the other hand, urethritis produced by a *specific animal poison*

has a period of incubation of from four to fourteen days, and is attended with *chordee*, and is not to be cut short by what is called the abortive treatment, when the discharge is established."

Leucorrhœa as a Cause of Ophthalmia Neonatorum.—The occurrence of Ophthalmia in new-born infants, when the mothers have suffered from gonorrhœal leucorrhœa, is a subject nearly akin to that which we have been considering. Ophthalmia neonatorum, when it is caused by utero-vaginal discharges, is generally considered to depend upon muco-purulent infection. I have a case to offer which bears upon this point, and it will be seen that it favors the supposition that it may be the acid or epithelial secretion of the vagina in vaginal leucorrhœa, and not the irritation of purulent matter, which excites ophthalmia in the infant. May not the same cause operate in the production of gonorrhœal ophthalmia?

CASE XXIII.—*Epithelial Leucorrhœa communicating Ophthalmia Neonatorum in two successive Labors.*—The case I am about to relate I saw in consultation with Mr. Guthrie. A lady in moderately good health became pregnant in 1844, and for two or three months before her delivery she suffered from leucorrhœa with vaginal irritation, but without much pain. She had an easy and natural labor, but the child suffered severely from ophthalmia after birth. After the birth of this child she had one abortion, but she did not have another child till 1852. In this, as in the first pregnancy, leucorrhœa appeared in the latter months of pregnancy. Her labor was very quick, but two days afterwards the child was attacked with ophthalmia, and it became totally blind of both eyes. I saw this lady six weeks after her confinement. The lochia had ceased a fortnight after delivery, but the leucorrhœa remained very much as it was before her delivery. The discharge was profuse, but the local symptoms were not severe, though she was much out of health. On examination, the uterus was bulky and low down in the vagina, the vagina itself being loose and injected, and falling in between the valves of the speculum during the examination. There was a slight discharge from the *cervix uteri*, but the greatest quantity was secreted by the vagina. I carefully collected some of the mucus from the vagina and from the *cervix uteri*. Both specimens were distinctly acid. The cervical mucus was curded by the vaginal acid, and this no doubt was the cause of its acidity. Under the microscope, the cervical mucus consisted of mucus-corpuscles and plasma,

with a few epithelial scales, while the vaginal mucus consisted of multitudes of epithelial scales, with some mucus-corpuscles, the latter being comparatively few in number. In this case there was no suspicion of gonorrhœa, and it is extremely improbable that a lady of station should have had a gonorrhœa in the latter parts of two pregnancies, occurring at a distance of eight years from each other, and that she should have been free from the discharge at all other times. Ophthalmia neonatorum when derived from the mother, has been held to depend, as I have already stated, on muco-purulent discharge from the os and cervix uteri; but this is rendered improbable when we consider the frequency of such discharges, and that a profuse secretion of mucus from the cervix uteri is the means by which the vagina is lubricated during labor.

Dr. Whitehead has performed an interesting experiment which bears upon the question of ophthalmia in young children. Fourteen days after her delivery, in the case of a woman whose infant suffered from ophthalmia a few days after birth, he took some of the matter from the diseased os uteri, and applied it beneath the upper eyelid of a dog. Increased vascularity of the eye was observed the first day, inflammatory turgescence the second, and on the fourth day there was violent conjunctivitis, with a profuse secretion of greenish-yellow pus.

There is, however, one circumstance which lessens the value of the experiment. Dr. Whitehead is himself not sure but that "the affection in this case may possibly have had a specific origin. His suspicions appear to point to a gonorrhœal origin, but I should myself strongly suspect the presence of secondary syphilis, the discharges of which are highly irritating. The case was that of a woman, aged twenty-six, who had been married nearly seven years. She was in good health until the second month of her first pregnancy, when she began to suffer from leucorrhœa, attended by severe local and constitutional derangement. She was several times threatened with abortion, but was delivered at the full term. The child had purulent ophthalmia, and died in a state of marasmus at the age of nine months. A second pregnancy terminated two years after, before the natural term, the child being still-born. In a third pregnancy she went the full term, and the child had purulent ophthalmia, which began on the second day after labor, and required a persevering course of treatment. Her fourth pregnancy terminated in an abortion at the end of the fifth month. For five years she was

treated by tonics, anodynes, and injections, by the practitioners under whom she had been, but without any permanent advantage. In the eighth month of her fifth pregnancy, she applied to Dr. Whitehead, who found the lower segment of the uterus ulcerated, and giving out an abundance of yellow leucorrhœal discharge. An alterative and tonic plan of treatment was commenced; the treatment consisting of small doses of the bichloride of mercury night and morning, and a dose of quinine twice a day, and two or three applications of the nitrate of silver. Dr. Whitehead lost sight of the patient until after her delivery at the full term, when three days from its birth the child was brought to him, suffering from purulent ophthalmia. In a short time he recommenced the treatment of the mother, and she became quite restored by four or five applications of the solid nitrate of silver, and an alterative treatment, "consisting principally of a mild mercurial, with the compound decoction of sarsaparilla, continued at suitable intervals during several weeks." The child, which was at first out of health, also became restored. This case was probably one of secondary syphilitic leucorrhœa.

I am aware that the cases I have supplied are not sufficiently numerous to be conclusive, but they render it possible that epithelial vaginal discharge may be the connecting link between gonorrhœa, contagious leucorrhœa, and ophthalmia neonatorum. The question again arises, is there any difference between a gonorrhœa in the female, the result of infection, and a leucorrhœa arising spontaneously, but capable of exciting urethritis or balanitis in the male? In the cases related, the microscopical appearances were nearly identical in the two forms of vaginal discharge. Is gonorrhœa in the female anything more than epithelial inflammation of the vagina, the discharges in which are so acrid as to irritate the male organs? It would probably be very instructive to make a series of microscopical examinations of the discharges in cases of infectious gonorrhœa in the female; of infectious gonorrhœa in the male; of leucorrhœa in cases where urethritis has been produced in the male, and ophthalmia in the infant; of the male urethral discharges in such cases; and of ophthalmia in new-born infants excited by gonorrhœa and leucorrhœa, respectively. I believe Mr. de Méric, the able exponent of the doctrines of M. Ricord, has already commenced such an investigation, in all that relates to discharges from the male urethra, and I have no doubt that his researches will prove highly valuable.

CHAPTER VIII.

THE ANATOMY AND PATHOLOGY OF THE OVULA NABOTHI.

I HAVE already referred to the occurrence of eruptions upon the os uteri, a condition which has been repeatedly observed by uterine pathologists. But there is one state of the os and cervix uteri which is deserving of particular attention—namely, that in which the so-called ovules of Naboth occur. The vesicles which have receive this designation, from an old supposition that they were abortive ovules which in their descent had attached themselves to the os and cervix uteri, are now generally considered to be obstructed mucous follicles. But, it is worthy of remark, that they are often found in situations where mucous follicles cannot be detected; and, after a careful examination of several cases in which these bodies were present, they appear to me to be a form of vesicular or eruptive disease, having its first seat in the deeper structures of the mucous membrane. They occur, for instance, very frequently upon the vaginal portion of the cervix uteri, outside the os, where, although it has been generally considered plenty of mucous follicles exist, the microscope fails to detect any follicular structure.

In this country the ovules of Naboth have been considered by nearly all writers as obstructed follicles. The only exception, as far as I am aware, is Dr. Whitehead, who gives excellent reasons against the prevailing views respecting these bodies; but fails, as it appears to me, to establish their real nature. He observes:—

“The causes of these appearances have not been satisfactorily explained. Indeed, the true anatomical structures and functions of the Nabothean follicles seem to be so imperfectly understood, that it may be difficult to refer their diseases to any agency in particular. They are constantly spoken of by writers as secreting organs, destined to furnish a fluid for the purpose of lubricating the cervix uteri and upper part of the vagina; the paucity, or abnormal abundance,

of this product is consequently often considered to depend on the state of the so-called cervical glands; hence their diseased condition is confidently referred to as constituting the pathology of leucorrhœal affections. Any share which they may have in the development of these phenomena, however, is almost, if not altogether, disproved by the fact, that in by far the majority of the worst cases of leucorrhœa, however abundant the discharge may be, and whether exhibiting mucous or purulent characters, these small bodies are not seen at all, nor can they, in many cases, be found, however carefully sought for. And, on the other hand, it generally happens, that in cases where the follicles are found to be morbidly developed, the adjoining parts being at the same time free from disease, the discharge is often exceedingly scanty, and not purulent.

"That the follicular bodies in question do occasionally emit a fluid, however, there is no doubt; but whether this is furnished in the manner of a regular glandular secretion, serving the purposes which have been assigned to it, admits of doubt. I have strong reasons for believing that their function is intimately, if not solely, concerned in the phenomena of the venereal orgasm. The part upon which they are situated is closely associated by nervous intersection with the ovaries, as shown by Dr. R. Lee; and it is extremely probable that the organic action in both is awakened simultaneously, and that the function of the one is never discharged independently of that of the other.

"From observations of my own, as well as from those of others, I have been led to regard the Nabothean bodies as consisting anatomically of an erectile tissue, inclosing a number of cells or tubes, which probably have a peculiar arrangement, and are highly organized. After the escape of their contents, the accumulation and emission of which appear to be but a momentary act, they immediately collapse and disappear from view; hence the difficulty of detecting them, whether before or after death, when free from disease."

Dr. Whitehead does not state the nature of the observations to which he refers; but it appears to me that there is no evidence of the existence of the follicular bodies, which Dr. Whitehead supposes to have a sexual function. No one has seen the Nabothean bodies, ovules, or follicles, at the os uteri, except in the form of cysts or vesicles, when they are always full of transparent or slightly opaque

matter, and may remain for weeks and even months without material alteration, until from the gradual accumulation of their contents, they ulcerate and disappear. The difficulty of finding them in the healthy state is one of the best proofs of their non-existence, except as a diseased condition.

Although writers on this subject have generally agreed that these mysterious bodies are obstructed mucous follicles, some have considered them as peculiar glandular structures, while others have believed them identical with the glandular crypts between the rugous columns of the cervix.

Dr. Lee, for instance, appears to make a distinction between the ordinary glands of the cervix and the glands of a Naboth. He states:—

“The penniform rugæ are situated in the middle of the cervix, between which there are seen numerous orifices of compound ducts or laminæ, which secrete a peculiarly viscid matter. The Nabothian glands, which often present the appearance of small sacs distended with viscid fluid, are situated both upon the margin of the os uteri and within the cervix.”

Dr. Rigby, on the other hand, considers the Nabothian follicles and the follicles of the cervix to be one and the same. His words are:—

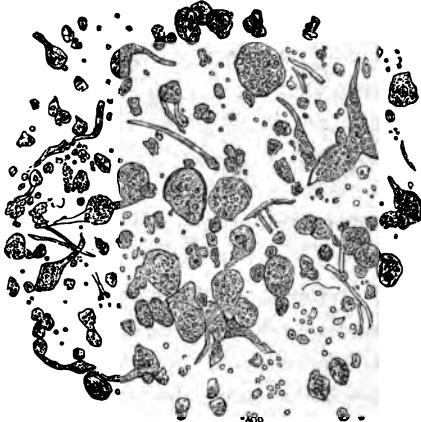
“Mucous follicles are only found in the cervix, especially at its lower part. When by chance these become inflamed, the orifice closes, and the follicle becomes more or less distended with a thin fluid. The mucous casts of these follicles have been known by the name of ovula Nabothi, having been mistaken by an old anatomist for Graafian vesicles which had been detached from the ovary and conveyed into the cavity of the uterus.”

The most recent foreign authorities on this subject are, I believe, MM. Huguier and Robin, both of whom have made valuable contributions to the pathology of the generative organs. The first volume of the *Mémoires de la Société de Chirurgie de Paris*, published in 1847, contains a paper by M. Huguier, entitled, *Mémoire sur les Kystes Folliculaires du Vagin*, in which the ovula Nabothi and their transformations are accurately described. M. Huguier considers them to be obstructed mucous follicles of the cervix uteri; but it is not a little singular that in the figured representation of these cysts which accompanies the memoir of M. Huguier, they appear to ex-

tend far beyond the limits of the cervical follicles; and, in one specimen, the cavity of the cervix, the muscular walls of the uterus, and the broad ligaments, are all studded with vesicles or cysts, presenting apparently the same character. I have repeatedly observed that in cases where the Nabothean bodies are met with, small cysts are found in the course of the Fallopian tube, or at its fimbriated extremity. Cystic formations are indeed very common in the different parts of the female organs, more so, probably, than in any other organs of the economy. M. Robin has also published in the *Archives Générales de Médecine*, volumes xvii. and xviii., 1848, a *Mémoire pour servir à l'Histoire Anatomique et Pathologique de la Membrane Muqueux Uterine, de son mucus, de la cadique, et des œufs ou mieux glands de Naboth*. The greater part of this able memoir is occupied by a minute description of the state of the mucous membrane during pregnancy; but the author is, like other pathologists, of opinion that the ovula Nabothi are nothing more than obstructed Nabothean glands; meaning by the latter the whole of the mucous follicles of the canal of the cervix uteri. He considers the mucus secreted by the glands of the cervix uteri, identical with the contents of the ovules of Naboth; he is, indeed, so convinced of the truth of this, that he describes the latter elaborately, but considers it unnecessary to describe the microscopical characters of the cervical mucus itself. Notwithstanding these authorities, I adhere to the opinion that these minute cysts are certainly in some cases independent of the mucous follicles of the cervix uteri, inasmuch as they are found in situations where no mucous follicles can be detected. These vesicles or cysts are sometimes seen upon the upper part of the vagina, upon the os uteri and external portion of the cervix, within the os, and upon the penniform rugæ as high up as the entrance to the cavity of the fundus. In all these localities they may present similar appearances. They are generally found as separate vesicles, and those which are lowest down at the os uteri are frequently the largest in size. It seems as if in some cases they descended from the cervix, though implanted in the mucous membrane, and became larger as they reached the os uteri and the external portion of the cervix. They frequently, however, are developed entirely upon the vaginal portion of the cervix. Sometimes bunches of minute cysts are seen hanging from the rugæ in the middle of the cervix. The open form of the follicles of the cervical canal is not such as to favor the frequent occurrence of

obstructions by the inflammation, adhesion, and obliteration of the mouths of the follicles. They are generally only very slightly pouched, and seldom possess any narrow outlet for the mucous secretion ; being merely pits upon, and between, the septa, forming the rugæ. Yet the so-called ovules are often found in patches upon the most open part of the secretory network of the canal. The covering of the so-called ovules of Nabothe is a thin fibrous membrane. Their contents are a white, pearly, coagulated matter, in which numerous granular corpuscles, mucus-corpuscles, and minute points of oily matter, are found. In some of these cysts a considerable quantity of cholesterine is also detected by the microscope.

FIG. 24.

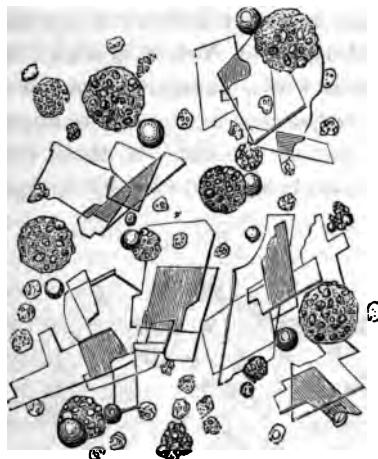


Contents of a Nabothian ovule,—granular corpuscles, mucus-corpuscles, and points of fatty matter. 220 diameters.

As regards pathology, these small cysts or vesicles seldom appear, except in diseased states of the os and cervix uteri. They are frequently attended by profuse discharges from the cervix, with an engorged and patulous condition of the orifice. In the lower part of the cervix, and upon the surface of the os uteri, the walls of the cysts or vesicles become thinner as the cysts become more prominent, and rupture, leaving small pits of ulceration, which may either heal or spread over the mucous surface. When any of these bodies are found in different states of maturity upon the os uteri, the marks of previous vesicles, which have ruptured and discharged their contents, are generally visible. It appears to me that the growths found

upon the os uteri, termed vesicular polypi, have their origin in these small cysts. In vesicular polypus, a small body, which seems to be nothing more than one of these Nabothean bodies which has become

FIG. 25.



Contents of a Nabothean ovule,—large granular corpuscles, and laminae of cholesterol. 220 diameters.

elongated instead of rupturing, projects from the surface of the os uteri, and bleeds as freely as though a small bloodvessel were opened. Blood will sometimes slowly exude from these small bodies for many months without intermission, until the patient's strength is quite

FIG. 26.



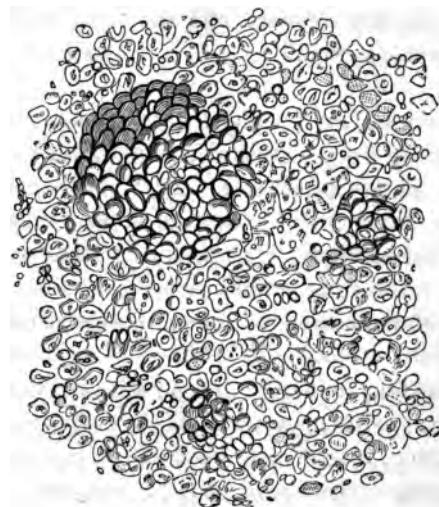
Os and cervix uteri partially inverted, and showing the cervical rugæ.
Two Nabothean ovaries are visible, and the surface of the os is eroded in patches. Natural size.

exhausted by the slow and continuous hemorrhage. I have seen several cases of this kind in which extreme anæmia was produced,

but in which the destruction of the vesicle by a pencil of nitrate of silver instantly arrested the hemorrhage. In one of these cases a variety of treatment had been resorted to in vain, and the cause of the hemorrhage was only seen after dilating the os uteri.

In the middle of the walls of the cervix, what appears to be undoubtedly obstructed mucous follicles, are sometimes seen. When describing the anatomy of the mucous cysts, I have mentioned that occasionally the follicles of the cervix are so deep as to admit a

FIG. 27.



Contents of an obstructed mucus-follicle,—mucus-corpuscles, masses of fatty matter, and single fat globules. 420 diameters.

bristle to the extent of the sixth of an inch, and that the follicular cavities are sometimes obstructed and filled with inspissated mucus. But the appearance of these obstructed follicles and their microscopical characters are very different from the Nabothean bodies. To the naked eye the contents of the obstructed follicles are white and opaque. When opened they have the appearance and consistency of curd; and under the microscope, they contain myriads of mucus-corpuscles, with an abundance of single fat-globules, and occasionally large agglomerations of oily matter.

The following is a description given by Dr. Whitehead of inflammation and suppuration of the Nabothean bodies: "Inflammation

and ulceration of the Nabothean follicles is occasionally seen to accompany any of the morbid conditions already noticed ; it is most frequently met with, however, in a distinct form, in simple inflammatory hypertrophy of the cervix ; but whether as a primary affection, or merely as the result of the surrounding vascular excitement, I have had no means of ascertaining. Upon first viewing the part, it appears to be studded with a number of raised, circular spots, having the dimensions of small peas, covered with a white crust, the surrounding surface being of a reddish hue. This white pellicle is easily removed by means of lint, exposing a surface of the same form and size, slightly elevated, and appearing as if composed of a number of extremely minute granules. The parts are not painful to the touch."

"When witnessed in the above form, the spots are numerous, from ten to twenty being visible at one view, but on some occasions not more than one or two are seen ; and I have sometimes witnessed them under the latter circumstances, to become very prominent and callous, assuming after a time a warty appearance. This change very probably arises from specific causes."

"In cases of induration of the cervix occurring in cachectic habits, the follicles are liable to inflame and suppurate in considerable numbers, leaving as many small circular cavities, which give to the part a worm-eaten appearance. If the suppurative action should continue to extend, two or more of the orifices may coalesce, forming a deep, irregularly-shaped cavity, with callous, overhanging margins ; this probably constitutes, on some occasions, the commencement of what has been described as the corroding ulcer. In œdema of the cervix, the whole surface is sometimes studded with small follicular points, the size of pins' heads ; they are perceptibly elevated above the general surface, and feel upon tactile examination as if slightly indurated ; but are insensible to pressure."

It should be mentioned that the case of "corroding ulcer," described by Dr. Whitehead, was apparently the result of the rupture of some large Nabothean cysts, and not at all allied to the malignant disease usually termed corroding ulcer. It healed under the influence of remedies, whereas the true corroding ulcer is unfortunately the most uncontrollable form of carcinoma uteri. I have never seen an instance in which any malignant ulceration has followed the rupture of these bodies. In the foregoing quotation, Dr. White-

head refers to "specific" causes, and I suspect that much of the description applies to syphilitic eruptions of the os and cervix uteri, rather than to simple ulceration, the result of the rupture of the genuine Nabothean cysts or vesicles.

The following case resembles, in some respects, the condition referred to by Dr. Whitehead, but I could not ascertain the existence of any syphilitic taint in this instance.

CASE XXIV.—*Enlargement of the so-called Glands of Nabothe; eruptive Disease of the Os and Cervix Uteri.*—M—G— applied as an out-patient of the department of the diseases of women at St. Mary's Hospital, in May, 1853. The history of her ill-health was as follows:—The catamenia had appeared at the age of 14, she married at 22, and has had seven children at the full term. She is now 39 years of age. She has constantly menstruated at an interval of three weeks instead of a lunar month. In August, 1851, she miscarried in the fourth or fifth month of pregnancy, since which she has been in bad health. Uterine hemorrhage continued for twenty weeks after the abortion without intermission. Subsequently to this, menstruation was tolerably regular, but profuse and painful, and in the intervals between the catamenial periods she had profuse leucorrhœal discharge. Sometimes the vaginal discharge was yellow, at other times it was tinged with blood. On two or three occasions she had suffered from extensive flooding, and it was after an occasion of this kind that she applied at the hospital.

Her complexion was sallow, with the red spot of hectic visible over the malar bone. She was extremely feeble, the pulse was above 100, and she complained much of palpitation, difficulty of breathing, and night sweats. Her appearance altogether was very much like that of a person affected with malignant disease. She complained of acute and constant pain in the sacral and hypogastric regions, and she slept badly. Her age was the age of cancer.

On examining with the finger, the whole of the os and cervix was found to be indurated, and about a dozen hard pisiform or shot-like bodies could be felt under the mucous membrane. The os uteri was, in fact, in very much the condition described by Dr. Montgomery, as constituting the first stage of carcinoma uteri. "The first discoverable change," he states, "which is the forerunner of cancer-

ous affections of the uterus, takes place in and around the muciparous glandulæ, or vesicles, sometimes called the ova Nabothi, which exist in such numbers in the cervix and margin of the os uteri; these become indurated by the deposition of schirrous matter around them, and by the thickening of their coats, in consequence of which they feel at first almost like grains of shot or gravel under the mucous membrane; afterwards, when they have acquired greater volume by further increase of the morbid action they give to the part the unequal bumpy, or nobbed condition, like the ends of one's fingers drawn closely together."

At first, after having examined by the touch only, I was inclined to think this was a case which would have justified Dr. Montgomery's description, and I suspected the existence of the first stage of cancer.

On examining, however, with the speculum, I saw that the whole os was considerably enlarged; that the villi were denuded of epithelium for the space of half-a-crown around the os uteri; and that the blood exuded from the naked villi. In the denuded surface and on the whole of the vaginal surface of the cervix, a number of the so-called ovules of Naboth were visible, not, as is usual, filled with transparent fluid, but containing hard, opaque matter. The whole of the os and cervix was extremely red and vascular. I scarified the os and cervix freely, and prescribed an astringent preparation of iron, with an opiate at night, and an occasional saline aperient. The scarification was repeated once a week for two or three months, and under its influence, with the internal administration of steel, the menorrhagia, dysmenorrhœa, and leucorrhœa diminished greatly. The catamenia were after a time suspended by the astringent, and I had to give her the common steel mixture in order to promote the catamenial secretion. Her health improved; she lost the pain in her back, and the eruptive condition of the os uteri disappeared. In November she applied to be dismissed from the list of out-patients, the catamenia having become regular as regards time, and normal with respect to quantity. On examination, the vesicular disease had entirely disappeared, and there only remained a slight oozing of mucus from the canal of the cervix uteri. The os and cervix were otherwise almost in the natural condition.

In conclusion, I think it can hardly be doubted by any one who examines this subject attentively, that much obscurity has prevailed

about what are called the follicles of Naboth, some considering them as the common mucous crypts between the rugæ of the cervical canal, while others have believed them to be special follicles found on the os uteri and in the lower part of the cervix. The term might very well be abolished altogether. As regards the ovules of Naboth, it seems equally certain that under this designation several dissimilar conditions, such as specific and simple eruptions of the os uteri, cysts or vesicles developed upon the mucous membrane, and possibly obstructed follicles, have all been grouped together.

CHAPTER IX.

THE RELATIONS OF LEUCORRHœA TO DISORDERS OF THE FUNCTION
OF MENSTRUATION.

THE chief disorders of the Menstrual Function, Amenorrhœa, Menorrhagia, and Dysmenorrhœa, frequently exist in combination with Leucorrhœa. It is, indeed, very rarely that leucorrhœa, with diseased conditions of the lower segment of the uterus, exists for any length of time, without inducing some disorder of the catamenial function. These derangements of the catamenia in leucorrhœal discharges, are found chiefly in connection with the cervical forms of leucorrhœa, or those cases of vaginal leucorrhœa in which the affection is confined to the surface of the os uteri and vaginal portion of the cervix. It is necessary to study such complications, as they modify to a considerable extent the methods of treatment which should be pursued, both as regards the leucorrhœal disorder and the derangement of the menstrual function. That leucorrhœa from the cervix uteri, with menorrhagia from the fundus; and leucorrhœa from the cervix, with amenorrhœa, or suspension of the secretion of the fundus uteri, should call for different means of treatment, is sufficiently obvious. In some cases of leucorrhœa, combined with disorder of the catamenia, the leucorrhœal complication is the secondary affection; amenorrhœa, menorrhagia, or dysmenorrhœa having preceded it; but most commonly, leucorrhœa is found to be the primary disorder in these cases, and the catamenial derangement has slowly followed upon chronic leucorrhœa.

Amenorrhœa and Menorrhagia in Leucorrhœa.—There is scarcely anything connected with leucorrhœa more difficult of explanation than the different conditions of the menstrual function in leucorrhœal discharges. One patient will be seen to have fallen into a state of amenorrhœa and chlorosis, as the result of long-continued leucorrhœa; while another will be seen in a state of anæmia from the loss

of blood occurring in repeated menorrhagic attacks ; the amenorrhœa and the menorrhagia apparently depending on the same cause. Why should leucorrhœa in one case cause amenorrhœa, and in another the opposite state of menorrhagia ? It appears as though in some cases the continuance of a leucorrhœal discharge from the cervix uteri, during months and years, so debilitates the ovaria and fundus uteri, that the catamenia diminish until entire amenorrhœa is established. / It seems in others, as though the same discharge, although accompanied by general debility, irritates the ovaria and fundus uteri so much, that the catamenial discharge is markedly increased, and there is an almost constant discharge of sanguineous fluid from the cavity of the fundus. / In producing the amenorrhœal state, the condition of the cervix acts as a counter-irritant : in producing the menorrhagic complication, it acts as a direct irritant to the fundus. It is difficult to say which of these complications deranges the health most ; for the anæmia of amenorrhœa is scarcely less decided than the anæmia of menorrhagia ; the first being caused by the feeble powers of sanguification when the ovario-uterine stimulus is withdrawn from the constitution ; the second, by the direct drain from the circulating fluid.

In leucorrhœa occurring as a complication of amenorrhœa, the lower part of the uterus is frequently pale, and the volume of the organ is below the natural size. Slight oedematous swelling of the os and cervix is sometimes met with. In these cases, the shape of the os uteri is considerably altered from the natural state. The surface felt by the finger upon examination is flat instead of rounded, and the anterior lip projects as a thin prominent edge into the vagina. The os and cervix uteri appear as if their shape had been moulded by the vagina, instead of preserving their natural contour. In many such patients, the indentations of the teeth are seen upon the edges of the tongue, and probably from the same cause, namely, the partial infiltration of the submucous tissues with serum. In leucorrhœa complicated with menorrhagia, the os uteri is, on the contrary, generally found red and abraded ; the whole of the lower part of the uterus and the vagina evidencing a large supply of blood to the uterine organs, not only during the catamenial periods but in the intervals between them.

Sanguineous Discharge from the Os Uteri simulating Menorrhagia.—One sanguineous complication of leucorrhœa is quite dis-

tinct from true menorrhagia, namely, when blood is poured out from fissures or abrasions of the os and cervix uteri, or from the cervical canal. In some of these cases, small quantities of blood escape daily, in combination with the leucorrhœal discharge, for many months together. This muco-sanguineous discharge from the cervix may simulate common menorrhagia, but the colored secretion really exudes from the cervix, while the fundus uteri remains inactive. In this way it may happen, that there shall be a continuous sanguineous discharge with periodical exacerbations, in which actual amenorrhœa shall notwithstanding exist, the sanguineous discharge issuing entirely from the os and cervix uteri. Many of the cases of supposed menstruation during pregnancy are of this kind.

When treating of periodical leucorrhœa, I shall have to show that in certain cases, the leucorrhœal discharge from the cervix occurs regularly at monthly intervals, and that this sometimes happens when there is a complete absence of the menstrual secretion. So, on the other hand, in cases of leucorrhœa combined with pregnancy or lactation, or in cases of amenorrhœa, the menstrual discharge from the fundus being suspended, we may have periodical discharges of blood from the os uteri and the canal of the cervix. Every month the leucorrhœal is converted into a sanguineous discharge. From some researches in which I have been recently engaged, respecting the immediate source of the catamenial discharge, I am led to conclude that in such cases the mucous membrane of the os and cervix is in a state very similar to the condition of the mucous membrane of the fundus, which I have found to exist at the time of genuine menstruation. In cases of this kind there is, every time the bleeding occurs, an exaggeration of the local disorder upon which the leucorrhœa depends, the epithelial surface of the os and cervix is more perfectly removed, and the subjacent villi are to a great extent destroyed by a process closely allied to ulceration. It is from this lacerated and denuded villous surface that the blood exudes. Thus, in such cases, the periodical bleeding from the os and cervix uteri is as strictly a species of vicarious menstruation, as the monthly bleeding which sometimes takes place from the stomach, lungs, mammae, or from the surface of ulcers.

It is easy to understand that sanguineous discharges can occur when the villi of the os uteri, and particularly the large villi of the cervical canal, are denuded of epithelium and sub-epithelial tissue, so as to leave the large vascular loops of the villi nearly exposed.

Under continued irritation, the denuded villi enlarge so much as to become visible to the naked eye, and obvious to the touch, and the blood can be seen to exude from them when irritated. When the villi are denuded of their epithelial coating, the discharge is generally tinged with blood after walking, coitus, or any other source of irritation, but sometimes they become so bare and turgid, as to exude blood constantly. Occasionally, in cases of excessive denudation, there are no signs of the secretion of pus, the whole discharge from the diseased surface consisting of blood, and the villi resembling a number of small bleeding vesicular polypi. Owing to the increased vascularity of the whole uterus during pregnancy, sanguineous discharge is very liable to occur as a complication of leucorrhœa, when abrasion or denudation of the os and cervix uteri exists, and in some cases it simulates menstruation during pregnancy, the villi bleeding regularly once a month under the influence of the menstrual nisus which occurs during pregnancy. In the following case the exudation of blood continued with scarcely any intermission during four months of pregnancy.

CASE XXV.—Leucorrhœa; Seven Premature Births.—Spurious Menorrhagia, continuing during the Eighth Pregnancy, and terminating in Abortion at the fifth month.—Mrs. D—, a lady of strumous temperament, marked with extensive cicatrices in the neck from glandular suppuration in early life. She is 29 years of age, and has been married ten years. From a period anterior to her marriage, she suffered from leucorrhœa, but has complained of little pain, or catamenial derangement, until the present year. She has had seven premature births, between the sixth and ninth months. On all these occasions the children were born alive. Two of the children are now living and healthy, the other five died, the earliest death occurring three days after delivery, and one of the children living four months. Her last miscarriage occurred in May, 1853. The lochial discharge continued for a month, when she had leucorrhœal discharge, without any tinge of blood for three weeks.

I was first called to this patient in October, 1853. She was then blanched from continued hemorrhage, sanguineous discharge having continued without intermission ever since the beginning of August. Occasionally it had amounted to severe flooding. She had not left her house, or indeed scarcely moved from the sofa, for several weeks.

On examination, I found the os uteri large and patulous, both the anterior and posterior lip being hard and bulbous. The cervix uteri was very short, and the body of the uterus greatly enlarged. The uterus could be felt very distinctly above the pubes. To the eye, the os uteri was abraded, and the cervix uteri everted. The villi were large and soft, and the blood could be seen exuding from them. It was evident that the sanguineous loss came not from the fundus uteri but from the lower segment of the uterus. It was a case, then, not of genuine, but of spurious menorrhagia. The areola round the nipple was dark and well developed, but she had not suffered from sickness as she had invariably done in her previous pregnancies. She had not noticed any monthly exacerbations of the discharge corresponding to her monthly periods. Notwithstanding the constant colored discharge, I expressed my opinion in favor of the existence of pregnancy.

I smeared the bleeding surface occasionally with the solid nitrate of silver, and gave her astringents, under which the hemorrhage almost entirely ceased. She became stronger, and was able to take moderate exercise in the open air. The abraded surface healed entirely. But in the middle of November she experienced a shock from the sudden death of a near relative; and soon afterwards she aborted, the foetus being about four months from conception. It had evidently been dead several days, as decomposition had commenced in the abdomen, and the cuticle had peeled off in many places. The occurrence of abortion did not bring back the diseased condition of the os uteri. The lochial discharge ceased in a few days, and she had no return of the leucorrhœa. After the abortion I gave her the sulphate of ammonia and iron, and ordered injections of alum and tannin, under which she became quite well.

This case might very well have passed for one of excessive menstruation during pregnancy. From the history it is probable that the state of the os uteri was the cause of the five premature births which had previously occurred. I made, as I always do in cases of repeated abortion, a careful inquiry, and could find no ground for the slightest suspicion of syphilis in this case. The husband was in excellent health, and declared that he had never contracted either syphilis or gonorrhœa. The two surviving children out of seven pregnancies, of the ages of six and eight, were perfectly healthy. This case, apart from the sanguineous discharge, illustrates the ten-

dency to disease of the glandular portion of the cervix, which exists in the well-marked strumous constitution.

Different Forms of Dysmenorrhœa occurring in Leucorrhœa.—Dysmenorrhœa is sometimes present in cases of leucorrhœa, particularly in cases in which hysteralgia accompanies the morbid state of the os and cervix present in some cases of leucorrhœa, but more commonly, the derangement of the catamenia takes either the amenorrhœal or the menorrhagic form. I have occasionally seen cases in which membranous menstruation has existed in combination with cervical leucorrhœa, and others in which a spurious form of membranous menstruation has accompanied vaginal leucorrhœa. In the cases of cervical leucorrhœa with membranous menstruation, the leucorrhœal discharge has been profuse during the intervals between the menstrual periods, while at each period a membranous formation, apparently distinct from a mere coagulum, has been expelled from the cavity of the uterus. Some of these cases are marked by exquisite pain at the catamenial periods; but in others little pain attends the membranous formation and its discharge. I have also observed some cases of severe dysmenorrhœa in connection with vaginal or epithelial leucorrhœa, in which there has been complete absence of all discharge from the glandular cervix. The form of membranous menstruation which attends certain cases of vaginal leucorrhœa is, as far as I have observed it, always painful.

There is also a form of difficult menstruation, which may be called vaginal dysmenorrhœa, in which, though the canal may be tolerably healthy in the menstrual intervals, an attack of vaginitis accompanies every catamenial period. In such cases, the dysmenorrhœal pain is complained of in the vagina, there is heat and throbbing in the passage, pain in defecation and micturition, and irritation of the lower part of the vagina by the passage of the urine. In some cases of this kind, the whole surface of the vagina is denuded of epithelium, which is discharged in flaky masses of considerable size. Examined after the completion of the period, the vagina is found to be exquisitely tender, and of a florid red color, with the flaky epithelium débris lying in patches upon its surface. This affection, like membranous menstruation from the fundus uteri, is generally attended by sterility. I was led to distinguish between vaginal dysmenorrhœa and uterine dysmenorrhœa by the microscopical examination of several cases of membranous

menstruation. In one class of cases of this kind, the membranous discharge consists of masses of scaly epithelium, and in the other, of fibrinous matter proceeding towards organization as a false membrane.

CASE XXVI.—*Vaginal Dysmenorrhœa, with Profuse Epithelial Desquamation.*—Mrs. T.— consulted me in 1852, under the following circumstances. She was 32 years of age, and had been married twelve years. She was moderately stout, and in good general health. For several years she had suffered from neuralgic pain in the left arm, and she was the subject of severe fits of hysteria occasionally. The catamenia were scanty, seldom flowing more than two days, and accompanied by severe pain. At each period, with rare exceptions, a considerable quantity of membranous matter was discharged from the vagina; she suffered also at the periods from severe pain in the bowels, and tubular casts were frequently passed at these times similar to the exudations of dysentery. Her husband was a healthy man, but she had never been pregnant. On examination, the os uteri was found tolerably healthy, no discharge issuing from it, but the uterus was very low in the vagina, the upper part of the passage being inverted. The vagina was red and congested, and particles of epithelium like bits of wetted paper were seen upon its surface. On several occasions, I examined the membranous matter discharged from the vagina during the periods, and found it invariably to consist of dense masses of epithelium. It is not uncommon in desquamation of the vagina, either with or without dysmenorrhœa, to find periodical irritation of the lower bowel, with membranous exudations from its mucous surface.

Dr. Handfield Jones related a case of membranous menstruation at the Pathological Society, February 3d, 1843, which bears upon the subject of vaginal dysmenorrhœa. The case was as follows:—

CASE XXVII.—*Dysmenorrhœa; with Epithelial Membranous Discharge.*—“A lady, aged 36, had seven years ago a difficult and premature labor, since which she had constantly suffered from uneasiness in the hypogastrium, incontinence of urine, painful feeling in the rectum, with occasional muco-purulent discharge. On examining the uterus two years ago, an ulcer of the size of a half-penny, with elevated edges and dirty grayish substratum, was seen

extending a little way within the lips of the os; the vagina was not ulcerated, but was unduly vascular; a small fissure also existed in the rectum, which had perhaps been occasioned by the pressure of the enlarged os uteri; her general health was affected, and there was emaciation. The ulcer of the os, which was cured by repeated application of nitrate of silver at intervals of four days, has not returned, but the os has remained congested and enlarged. The fissure of the rectum has been tolerably well for the last eighteen months, but during the two last periods she has passed membranous coagula tinged by blood."

"These membranous productions, common in congestive dysmenorrhœa, are usually regarded as consisting of lymph, or false membranes, as they are often termed. I certainly expected to find the well-known structural peculiarities of fibrinous films, when I began to examine them, and was not a little surprised to find that in every part they consisted entirely of desquamated epithelial scales. These were mingled with numerous altered nuclei and some blood-globules; they had the form of most perfect scales, and, for the most part, were perfectly formed and mature."

"I have had, through the kindness of Mr. Coulson, the opportunity of examining these membranous films twice; the first time they were composed of scales, just resembling those of the healthy buccal mucous membrane; the second time the scales contained a great many molecules of fatty matter, which gave them an opaque aspect."

Dr. Handfield Jones suspected that these membranous films were formed in the lower part of the neck of the uterus. But since the vagina and the vaginal portion of the cervix uteri are the only situations in the utero-vaginal canal in which scaly epithelium is found, I have no doubt the films were thrown off from the vagina, and that the case was one of vaginal dysmenorrhœa. The undue vascularity of the vagina, and the congestion and enlargement of the os uteri after treatment, furnish the clue to the real nature of the monthly desquamation of the vagina in this and similar cases.

Periodical Leucorrhœa.—There is a variety of leucorrhœa which has engaged the attention of numerous writers on uterine pathology, under the name of Vicarious Leucorrhœa, or leucorrhœa vicarious of menstruation. In this affection, the true nature of which has not been understood, a periodical leucorrhœa takes the place, either

partially or entirely, of the catamenial secretion. This kind of leucorrhœa has generally been thought to depend on the fundus uteri, the mucous membrane of the cavity of the fundus being supposed to pour out a white or transparent mucous discharge, instead of the sanguineous menstrual secretion. It has been referred to by many authors, from a distant date to the present time. Friend called this affection "lymphlike menses;" Sylvius, and others, "menses albi," "menstrua albi," &c.; Astruc regarded it as leucorrhœa assuming the place of menstruation. Hamilton thought the symptoms of vicarious leucorrhœa were a sufficient proof of the connection between vicarious leucorrhœa and the function of menstruation. Dewees considered it as the slow establishment of the catamenia. Dr. Whitehead classes it with vicarious menstruation. Dr. Ashwell is of opinion that, in this affection, the minute extremities of the uterine arteries secrete a mucous instead of a sanguineous fluid. I have found, however, upon examination, that such cases are simply cases of cervical or mucous leucorrhœa, in which the secretion, instead of being continuous, as in ordinary leucorrhœa, is poured out periodically. Thus, in periodical leucorrhœa, an excited condition of the canal of the cervix uteri, takes the place of the true menstrual excitement of the cavity of the fundus uteri. When treating of the physiology of the cervix uteri, I gave my reasons for believing that in health the secretion of the mucous plug takes place periodically; and it appears to me that periodical leucorrhœa is nothing more than an increase of the natural periodical secretion of the cervical canal, combined with partial or entire amenorrhœa. It will not be without use to compare, and contrast, the hyper-secretions of the cavities of the cervix and fundus uteri with each other. In certain cases of menorrhagia, the sanguineous secretion continues for months without intermission. This may be compared to common persistent leucorrhœa. In other menorrhagic cases the periodical flow is merely increased, and we may compare this to periodical leucorrhœa. In periodical leucorrhœa combined with amenorrhœa, the ovarian stimulus, instead of exciting the fundus uteri, excites the cervix uteri to increased secretion. As the discharge consists merely of mucus, and does not at all resemble the menstrual secretion, it cannot properly be considered as a variety of vicarious menstruation.

This peculiar affection may occur at any time between the advent

of puberty and the decline of the catamenia. It is present occasionally at the age of puberty, when the catamenial discharge is not regularly or adequately established; or it may appear at the catamenial climacteric, when the genuine periods become irregular, and are about to cease. But perhaps periodical leucorrhœa is more frequently observed during lactation, in mothers who do not menstruate while suckling, than at any other time. In such cases the active condition of the mammae suspends that monthly development and disorganization of the glandular mucous membrane of the cavity of the fundus, upon which the menstrual flow directly depends, but the periodical nisus exhibits itself in a periodical activity of the glands of the cervical canal. In some nurses, there is constant leucorrhœa during the whole of lactation, with a periodical increase of the leucorrhœal discharge; in others, there is complete absence of discharge in the intervals between the periods, but a profuse leucorrhœa, occupying four or five days, comes on every month with great regularity. I have not seen any cases of periodical leucorrhœa in which the vagina has been the seat of the discharge. This affection is not vicarious of menstruation in any other sense than that it generally occupies the time of the catamenial period; it does not at all resemble those true forms of vicarious menstruation in which a sanguineous fluid is poured out from some secreting surface remote from the uterus itself. Periodical leucorrhœa sometimes occurs during the whole of pregnancy; a sufficient proof, as it appears to me, that the discharge is not secreted by the vessels from whence the menstrual secretion is derived. It is not without use to perceive the real constitution and seat of this secretion; for those who have referred it to the fundus uteri, and considered it a form of menstruation, have thought the mucous membrane of the fundus must necessarily be in a state of excitement at the dates of the leucorrhœal discharge, whereas I believe its real condition is one of torpor. We must, however, infer from some cases of this kind, in which impregnation takes place, that the ovaria may be periodically excited during the presence of periodical leucorrhœa, and perform the function of ovulation, the same as in ordinary menstruation.

The following cases illustrate some of the most usual forms of periodical leucorrhœa.

CASE XXVIII.—*Periodical Leucorrhœa, in which Cervical Mu-*

cous Discharge partially took the place of the Catamenial Secretion.

—E— B—, an out-patient of St. Mary's Hospital, aged twenty-two. She began to menstruate at fifteen, and menstruated regularly and naturally until two years ago, the catamenial period lasting five or six days. Since this time, the catamenia had been very scanty, rarely lasting more than one or at most two days. After the ceasing of the colored discharge, she uniformly has a white discharge for the same number of days as the catamenial flow lasted when she was in health. When the period has passed, she has no leucorrhœal discharge until the next monthly disturbance comes round. Her digestion is deranged, and she is pale and chlorotic in appearance. The white discharge in this case, when examined by the microscope, consisted simply of cervical mucus. Under the use of emmenagogues and hip-baths, the catamenial secretion gradually increased in quantity and duration so as to occupy the whole of the period, and upon the healthy establishment of the catamenia, the leucorrhœal secretion ceased entirely.

CASE XXIX.—*Periodical Leucorrhœa occurring in the intervals between the Catamenia.*—H— J—, aged thirty-five; unmarried. She had a child ten years ago, and got up very soon after her delivery. Since that time, she has constantly suffered from prolapsus, and complete procidentia formerly existed for two or three years. The perineum is lacerated to the extent of about an inch, and the posterior part of the vagina protrudes through the genital fissure. At the present time, the uterus is very low down in the vagina, the os patulous, and a constant cervical leucorrhœa present. The catamenia are regular, and are attended by considerable pain. Besides, however, the usual monthly discharge, she is attacked in the middle of the intervals between the periods, with pains similar to those of menstruation, but which end in a profuse discharge of white mucus. These symptoms come on with as much regularity as the menstrual periods, and they last four or five days. I examined some specimens of the periodical white discharge, and found that it consisted entirely of an increase of the ordinary mucous or cervical leucorrhœa. This patient attended at the hospital as an out-patient for two months, when she went into the country improved in health.

CASE XXX.—*Chlorotic Amenorrhœa with Periodical Leucor-*

rhœa.—L—D—, aged twenty, a tall, thin young woman, of pale, chlorotic complexion, with the prolabium bloodless, and the tongue pale and fissured as in chlorosis. Has not menstruated for two years. Before that term, she menstruated regularly, but scantily, for three months, but these three times have been the only occasions on which the catamenia have ever appeared. During the two years in which she has suffered from amenorrhœa, she has regularly had a monthly white discharge, accompanied by pain in the back and loins, lasting for three or four days, but ceasing entirely after this time. She has no trace of leucorrhœal discharge at any other time than the monthly periods. This periodical discharge consisted, as in the other cases, entirely of the increase of the cervical mucous discharge, and disappeared as the catamenia were restored.

CASE XXXI.—*Periodical Leucorrhœa occurring during Lactation.*—Mrs. R—, aged twenty-seven, the mother of two children, both of which she has suckled. The youngest is five months old. She had never been troubled with leucorrhœa before her marriage, and is quite free from discharge during her pregnancies ; but while nursing she has a constant leucorrhœal discharge to a moderate extent. The catamenia are absent while she nurses, but she has a distinct monthly attack of pain in the back, accompanied by a profuse white discharge, which lasts the same number of days, and is much the same in quantity, as the catamenial discharge. In this case the os and cervix uteri were healthy, and I found that the white discharge consisted almost entirely of the cervical mucus, being chiefly made up of plasma and mucus-corpuscles. Cases similar to this are very common ; and unless the discharge is profuse, no bad results ensue. The leucorrhœa generally disappears after weaning and the reappearance of the catamenia. In other cases, the monthly leucorrhœa becomes gradually changed into a persistent discharge, inducing great debility, and rendering the patient unfit for the duties of nursing. Periodical leucorrhœa almost seems the normal condition in some women during lactation. As I have already remarked, the secretion of the cervical mucus is increased in the healthy, unim-pregnated female once a month. During lactation the same thing occurs, perhaps in a greater degree, or it is more obvious, because of the absence of menstruation. However this may be, it is the fact

that there are few women in whom the function of menstruation is suspended during lactation, in whom the date of the monthly period is not marked by a periodical discharge of mucus from the glands of the cervix uteri. In some women who suffer from leucorrhœa during lactation, a curious relation is preserved between the leucorrhœal and lacteal secretions. The occurrence of uterine after-pains every time the infant is put to the breast, or on the occurrence of the sensation of the draught in the breast, is a matter of common observation. In some cases these sympathetic after-pains continue for weeks, and an increase of the mucous secretion of the cervix gradually becomes mixed up with the painful sensation. I have met with cases of this kind in which, during the whole of lactation, the act of suckling and the sensation of the draught have been accompanied by a sudden increase of discharge from the cervical canal, and sudden pain in the back. This synergic action between the mammary glands and the mucous glands of the canal of the cervix uteri, of course, ceases as soon as weaning has taken place.

CHAPTER X.

THE RELATIONS OF LEUCORRHœA TO STERILITY AND ABORTION.

THE relations of leucorrhœa to sterility, and the modes in which barrenness is produced, or impregnation prevented, in this disorder, are subjects well worthy of consideration. Some women who are affected with leucorrhœa conceive almost as regularly as though they were free from any derangement of the generative organs; while others do not conceive during the presence of this disorder, though they are not otherwise sterile, as is frequently proved by the fact of their becoming pregnant on the removal of the leucorrhœal discharge.

The necessary conditions of fertility depending upon the female, are that, on the one hand, the ovule shall be properly prepared in the ovary, and that the access of the impregnated or unimpregnated ovule to the cavity of the fundus uteri shall be perfect; and, on the other, that the spermatozoa shall pass without injury from the vagina upwards towards the ovary. If any impediments to either of these processes exist, normal pregnancy is impossible. Thus there are two distinct classes of cases in which leucorrhœa causes sterility. The one consists of those cases in which the function of menstruation and ovulation is disordered, as a secondary result of leucorrhœa. The other consists of cases in which the spermatozoa are either prevented from entering the uterus, or are destroyed by the unhealthy utero-vaginal secretions. In some cases of leucorrhœa both these causes concur, from the quantity and quality of the discharges. Thus in one form of the sterility depending upon leucorrhœa, the female, and in the other the male, element of fertilization is rendered abortive.

I have already referred in detail to the relations which exist between leucorrhœa and the disorders of the catamenial function. In those cases of cervical leucorrhœa in which menorrhagia is pro-

duced as a secondary disorder, to such an extent as to cause general anaemia, impregnation is frequently prevented. A state of general anaemia, probably, by interfering with the maturation of the ovules in the ovaria, is always unfavorable to fecundation. Moreover, in menorrhagia, the ovaria and uterus are frequently rendered unfit for impregnation and gestation by the effects of local loss of blood upon these organs. It is also probable that in some cases of menorrhagia the ovule passes down the Fallopian tube, and is washed away during the profuse catamenial flow, thus rendering impregnation impossible. Sterility is almost an invariable result when leucorrhœa leads to amenorrhœa and chlorosis, with complete torpidity of the ovaria and fundus uteri, the function of ovulation and the secretion of the menstrual fluid being both suspended. Instances of sterility are also frequently found in cases of cervical or vaginal leucorrhœa complicated with membranous menstruation. The exceptions are very few in which conception can occur simultaneously with the exudations peculiar to this form of dysmenorrhœa. These exudations appear to render the cavity of the fundus uteri unfit for the reception and support of the impregnated ovule. Sterility is also a frequent result in those cases of leucorrhœa combined with dysmenorrhœa, in which there is simply neuralgic menstruation of an intense character. Other forms of sterility might be specified in connection with leucorrhœa. Whenever in fact leucorrhœa induces, either directly or indirectly, such derangement of the catamenial function as to prevent the maturation of healthy ovules in the ovarium, or to render the canals of the Fallopian tubes and the cavity of the fundus uteri unfit for the transmission and retention of the ovum, sterility is the necessary consequence.

I have already referred to the normal mucous secretion of the canal of the cervix uteri, and which in all probability favors the ascent of the spermatozoa, or at all events permits them to move as freely as the mucus of the seminiferous tubes or the vesiculæ seminales. But in cases where a thick and highly viscid string of mucus is constantly exuding from the os uteri, we can easily understand that the ascent of the spermatic particles through the cervical canal may be impeded mechanically. Probably, also, when the flow of mucus from the cervical canal is profuse or muco-purulent, the increased alkalinity of the discharge exerts a prejudicial influence upon the spermatozoa.

Impregnation may without doubt be prevented in cases of cervical and vaginal leucorrhœa, in which the discharges are of such a nature as to destroy the vitality of the spermatozoa before their ascent into the cavity of the fundus uteri. M. Donné found, experimentally, that in the healthy secretions of the utero-vaginal canal the spermatozoa remained active for a considerable time ; but he found that in certain morbid conditions of the vaginal and cervical mucus the spermatozoa were almost immediately destroyed. In particular, he noticed that the spermatozoa were killed almost immediately by the highly acid state of the vaginal mucus in pregnancy. M. Donné considers, and I believe with good reason, that an excessive acidity of the vaginal mucus, and an increased alkalinity of the cervical mucus, are alike destructive to the spermatozoa. Dr. Whitehead has referred to these points in a very able manner, though he does not in all respects agree with M. Donné. In my own examinations I have found that in vaginal leucorrhœa the acidity of the secretion is always considerably increased, unless the vaginal membrane pours forth pus, or some other complication is present ; while in cervical leucorrhœa, the alkalinity is as constantly deeper than it is in a state of health. Probably, in leucorrhœa, other qualities hurtful to the spermatic particles are present in addition to mere acidity or alkalinity.

Some original and highly interesting experiments of the late Mr. Newport, published in a paper on the "Impregnation of the Ovum in the Amphibia," in the first part of the Philosophical Transactions for 1851, have an indirect bearing on the relations of the utero-vaginal secretions to sterility in the human subject. The experiments of M. Donné showed that the morbid conditions of the utero-vaginal discharges were fatal to the movements of the spermatozoa, bodies which the researches of Kolliker and others have classed with the vibratile cilia of other parts of the body. Many physiologists had, however, doubted whether it was the spermatozoa or the liquor seminis which acted as the efficient agents in impregnation. Mr. Newport's researches appear to demonstrate that not only are the spermatozoa destroyed by certain agencies, among which acids and alkalies, are pre-eminent, but that impregnation is effected by the spermatic cilia alone, and not by the agency of the liquor seminis. It was found that when the seminal fluid was filtered, so as to separate the spermatozoa almost entirely from the liquor seminis, the impregnating power of the spermatozoa was im-

mense, while that of the liquor seminis was very small, and commensurate only with the small number of spermatozoa which had passed through the filter. When the spermatozoa were entirely separated, the liquor seminis was quite incapable of impregnating ova. Mr. Newport found that when semen in which the spermatozoa were active and abundant was exposed to a weak solution of potass, the spermatozoa became motionless, shrivelled up, and were speedily dissolved and destroyed. He also observed that when dilute acetic acid was applied to the spermatozoa they quickly lost all vitality, and were left extended and motionless. In other experiments the ova were bathed with spermatic fluid, and subsequently washed with acetic acid or solution of potass; or they were first washed with the acid or alkaline solution, and then bathed with seminal fluid. In either case the process of impregnation was almost or entirely prevented. Although these experiments were performed on the ova and spermatozoa of amphibia, in which impregnation takes place out of the body, so as to become the subject of direct observation, we may argue from them, as well as from the observations of M. Donné, and what is observed from sterility in cases of leucorrhœa, that vitiated alkaline and acid utero-vaginal secretions must necessarily be inimical to the human spermatozoa during their passage upwards from the vagina.

These considerations point to the propriety of examining the utero-vaginal secretions in all cases of leucorrhœa accompanied by sterility, and to the necessity of restoring the secretions to a healthy condition, or of neutralizing the excess of acid or alkali which attends the cervical and vaginal varieties of this affection.

Besides these forms of positive sterility which are met with in leucorrhœa, there are other kinds of infertility, as in those cases in which, although conception may occur, it is pretty sure to be followed by abortion. This subject has been treated of at length, first by Dr. Bennet, and afterwards by Dr. Whitehead. It is found that women of excitable habit, suffering from leucorrhœa, with an irritable or abraded os and cervix uteri, frequently abort a great many times in succession. The same thing occurs, as already stated, in syphilitic leucorrhœa of a secondary character. In women with non-specific leucorrhœal disorder of the os and cervix uteri, abortion is caused in the early months by the influence of irritation of the lower segment of the uterus in causing premature

expulsive action. In the later months of pregnancy this local irritation is increased by the changes which take place in the cervix of the gravid uterus. In syphilitic leucorrhœa, abortion may occur either from the local irritation of the os and cervix uteri, or from the effects of the syphilitic poison in destroying the ovum, the abortion then depending upon the death of the foetus. It has frequently been said that in non-specific leucorrhœa, the ovum is injured by the discharge, but it is difficult to explain how this can happen, except in cases where leucorrhœa and its complications produce such debility as to interfere with the nutrition of the foetus. Dr. Henry Bennet is of opinion that disease of the lower segment of the uterus often produces such an amount of inflammatory congestion of the whole uterine system as to be incompatible with the development of the foetus in early pregnancy. To this he traces the death of the ovum, disease of the placenta, and the formation of moles. I cannot subscribe to these views, as, if such things occurred in simple inflammatory and ulcerative leucorrhœa, they ought to occur still more so in cases of carcinoma of the cervix uteri, which is not found to be the case. The direct influence exerted upon the nutrition of the ovum by disease of the os and cervix uteri is, in my opinion, very inconsiderable.

When abortion occurs in leucorrhœa, or in disease of the lower segment of the uterus of a non-specific character, it is reasonable to suppose that the abortion is excited by the irritation to which the os and cervix are subject, under the combined influence of local disorder, and the local changes induced by the development of the organ in pregnancy. No doubt in some cases the predisposition to abortion is given by the debilitating effects of the leucorrhœa, and of the local disorder, upon the general system. In some patients suffering from leucorrhœa, without abrasion or ulceration, but in whom the uterus is in an irritable or neuralgic condition, repeated abortions occur. In these cases the distension or development of the uterus seems unable to pass beyond a certain point, and the abortions occur one after another at very nearly the same date of pregnancy. The repeated abortions when they occur in cases where there is no suspicion of specific disorder, are chiefly met with in women of highly nervous temperament, the strumous habit, or in constitutions enfeebled by other diseases.

In Dr. Whitehead's work on abortion and sterility, the leading

idea is the frequency of abortion in connection with leucorrhœa ; but, as I have before observed, I consider the syphilitic element a very large one in his numerous cases, and that they by no means represent the actual frequency of abortion as caused by non-specific leucorrhœa and disorder of the lower segment of the uterus.

I have already referred to syphilis as a cause of sterility. In a certain proportion of cases, women who have been affected with primary syphilis, and who subsequently marry, do not conceive as long as they are the subjects of secondary syphilitic leucorrhœa. In other cases, women who have received the secondary disorder through the medium of an infected ovum, and who have become affected with syphilitic leucorrhœa, do not bear any more children as long as they themselves remain affected with secondary syphilis. As the general rule, women thus affected conceive and abort repeatedly, or give birth to a succession of diseased children, but still exceptions are not unfrequently found, in which the secondary syphilitic poison distinctly causes infecundity in the female. The same thing happens also occasionally in the male subject. When secondary disorder causes sterility, it probably does so from the effects of the syphilitic cachexia upon the constitution and upon the ovario-uterine functions, and from the effects of the syphilitic leucorrhœa upon the spermatozoa. Dr. Whitehead has observed the occasional effects of secondary syphilitic disease of the uterus in causing sterility, but it is remarkable that in the whole of the valuable cases contained in his work on *Hereditary Transmission*, there is not, I believe, one distinct case of the conveyance of secondary syphilis to the mother through the medium of the ovum, without the intervention of primary syphilis. All his cases of uterine syphilis are either cases of secondary syphilis following upon primary syphilis in the female, or cases in which he considers secondary syphilis to have been communicated directly from the male to the female by the secretions or discharges of secondary disease. Dr. Whitehead's cases must speak for themselves, but as far as my own experience goes, the ovum, and not the secretions, is the great means of the communication of secondary syphilis from the male to the female.

The following cases illustrate the observations which have been made respecting the influence of non-specific and specific leucorrhœa in causing sterility.

CASE XXXII.—*Sterility the result of Leucorrhœa.*—R—G— was admitted into St. Mary's Hospital, under my care, Sept. 5th, 1851, after having attended several weeks as an out-patient, and the following account of her case, while in the hospital, is abridged from the note-book of Mr. Trotter, one of the resident medical officers. She was at the time of her admission 21 years of age, and had been married fifteen months. The catamenia appeared about 14. The flow of the periods was from the first profuse, and when she was 16 the sanguineous discharge continued without intermission for two months, but afterwards disappeared for eight months. She has always been subject to profuse leucorrhœal discharge in the intervals between the catamenial periods. Since her marriage the catamenia have been very frequent and profuse, sometimes recurring every other week. She complains of pain across the lower part of the abdomen, and in the lumbar region, constant shooting pain in the vagina extending upwards, accompanied by great irritation of the bladder. The pain is always most troublesome at night. She has suffered for several years from ascarides, the worms accumulating in the rectum, and being discharged in masses, every two or three weeks.

On examining the vagina and uterus, the vagina was found partially inverted, and the uterus prolapsed to a corresponding extent. The whole of the vaginal portion of the cervix was entirely denuded of epithelium; the cervix was large, intensely red, and covered with pus mixed with blood. A stream of thick yellowish mucus issued from the canal of the cervix uteri, which gaped widely open, showing the canal to be of an intensely red color, and denuded like the vaginal portion of the cervix. The discharge was so profuse as almost to fill the vagina. The urine was highly acid. She was kept in bed, and ordered soothing and astringent injections, tonics, and alkalies, with injections to the bowel of quassia and the compound decoction of aloes; tincture of iodine was frequently applied to the os uteri, and at the end of a month she left the hospital much relieved. After this the os uteri was freely scarified from time to time, and the epithelium began to reappear in patches upon the os and cervix uteri. In this case the presence of ascarides in the rectum was largely concerned in the production of the menorrhagia, leucorrhœa, and disease of the os and cervix. It was found extremely difficult to remove these troublesome parasites, their return generally taking

place after two or three weeks of freedom, and being always attended by an increase of the leucorrhœa and the uterine symptoms. It was only by raising the tone of the patient by a long course of steel and tonics, with the constant use of quassia injections to the rectum, that they were at last removed, and as this was effected the uterine symptoms disappeared. In the autumn of 1852 this patient became pregnant, and presented herself at the hospital, with her child, in the middle of 1853.

CASE XXXIII.—*Sterility the result of Leucorrhœa and Induration of the Os Uteri.*—Madame E—, the daughter of a physician, was married, having been previously in good health, in 1846, and shortly afterwards became pregnant. She was delivered in February of 1848 after a very severe labor. She nursed her infant, but from the time of her accouchement she suffered from leucorrhœa, with dragging pain in the back and hypogastrium, which nearly incapacitated her from walking. After weaning she became more regular, but suffered a good deal of pain at the menstrual periods. She came under my care in October, 1852. At this time she had been quite unable to walk for a year, and had been constantly treated for leucorrhœa. Intercourse was excessively painful. There was some amount of prolapsus, but the vagina, with the exception of its partial inversion, was healthy. A profuse discharge of mucus issued from the canal of the cervix uteri, consisting entirely of mucus-corpuscles and the usual plasma. This discharge was highly alkaline. The anterior lip of the os uteri was healthy, but the posterior lip was very much enlarged, indurated, and excessively painful to the touch. It was to this morbid condition that the acute pain of which she complained was attributable. In the treatment of this case, I gave no other medicine than a light tonic. For the local disease, I sacrificed the enlarged posterior lip freely once a week, with a view to the local abstraction of blood and the diminution of the enlargement during cicatrization; ordered an injection of a quart of cold water with Kennedy's syringe night and morning, to be followed each time by half a pint of a strong solution of tannin and alum, with a view to strengthen the vaginal wall and raise the uterus; and also directed a sponge pessary to be worn four or five hours daily with the same object. The pain soon became less acute, she gradually regained the power of walking, the enlarged uterine lip became less

in size and less tender, the cervical discharge ceased, and the uterus was raised to its proper position in the vagina. I ceased my attendance in January, 1853, when she was able to walk well, and was entirely free from pain. In August, she became pregnant, went her full time, and was delivered of a healthy child in May, 1854.

CASE XXXIV.—*Sterility the result of Secondary Syphilitic Leucorrhœa.*—In 1853, a gentleman applied to me respecting his wife, whom he proposed to place under my care. He stated that he had married a lady of good health and constitution eleven years previously. At the time of their marriage his wife was between 18 and 19 years of age. Before marriage the husband had been in the army, and had several times contracted primary syphilis. He had suffered from the last attack about six months before his marriage. He had been mercurialized several times, and thought himself perfectly well at the time he married. Since that date he has suffered from frequent sore throat, occasional eruptions of skin disorder, and his hair has several times fallen off, still he has been considered to have had tolerably good health. About three months before I saw him, he had observed an excoriation of the glans penis, and he was troubled with the idea that syphilis had broken out upon him spontaneously, and that he had given it to his wife. He declared that he had incurred no risk whatever of any new infection. I found on inquiry that his wife had become pregnant shortly after her marriage, and had since that time been a constant invalid. The child was born at the full time, and had been from infancy in a fair average state of health. The wife had, however, never been free from leucorrhœa; she had suffered much from sore throat, cutaneous eruptions, and irregularities of the menstrual function, to none of which had she been subject before her marriage and the pregnancy referred to. She had never again been pregnant, and for nearly ten years had been constantly under medical treatment. At the time the husband had noticed the abrasion upon the penis, the wife had complained of an aggravation of her symptoms, and these two circumstances, taken together, excited the husband's anxiety. She had been subjected to a great variety of treatment, including a course of cauterization of the os and cervix uteri, but she had never been mercurialized. On examination, the os and cervix uteri were perfectly denuded of epithelium, the surface of the

os was mottled with a papular eruption, and a profuse yellow discharge poured forth from the canal of the cervix. Her general health was in a wretched state. From a consideration of all the circumstances of the case, I had little doubt that the apprehension of the husband respecting the abrasion was groundless, but that he had given the lady secondary syphilis through the medium of the ovum in her first and only pregnancy. The syphilitic manifestations had been attended by sterility. The child born of this pregnancy presented no obvious signs of secondary syphilis, but I have seen other cases in which the children of women undoubtedly affected with syphilis have apparently escaped, and others of women who have borne syphilized children to diseased husbands, without themselves receiving the disease. In this case a mild but prolonged mercurial course, with local treatment of the leucorrhœa, entirely restored the health of the lady, but pregnancy has not yet occurred.

CASE XXXV.—*Sterility the result of Mucous and Epithelial Leucorrhœa.*—Mrs. J. ——, married in 1845, had always suffered from dysmenorrhœa with occasional leucorrhœal discharge. Since her marriage the leucorrhœa had almost been constant, and she had never been pregnant. I was first called to her in consultation in 1851. She was then suffering from great irritation of the uterus and vagina, the leucorrhœal discharge being profuse, and consisting of flakes of epithelial matter from the vagina, and mucus and pus from the os uteri and the canal of the cervix. The whole of the os uteri and the vaginal portion of the cervix were denuded of epithelium. The treatment of this case was spread over several months, and consisted of copious cold water and astringent injections, tonics, and the application of the solid nitrate of silver to the lower part of the uterus. Her general health and the local disorder improved, and she became pregnant in 1852. In the early months of pregnancy she went into the country, and being troubled with some return of the leucorrhœa she used cold water injections with such profusion as to induce abortion at about the fifth month. The leucorrhœa at this time appeared to consist of an increase of the natural mucus secreted by the cervix during pregnancy, but after the abortion there was a reappearance of the abrasion upon the os uteri, and she was again treated. She became pregnant a second time in the beginning of 1853, and in October she was delivered at the full

term. In this case, as in several others, I attributed the result of pregnancy to the application of the nitrate of silver. On both occasions the patient became pregnant after a free use of this application immediately before the catamenial period. It appears as though the application of the solid nitrate of silver is either followed in a few days by a healthy secretion from the surface to which it is applied, or the irritating discharges are neutralized by its use. Of its influence in removing sterility in leucorrhœa I have had many examples. Some cases of this kind which I have seen in consultation with Mr. Guthrie, and Mr. Walter Bryant in particular, leave no doubt upon my mind of the effects of this remedy, in cases where the disordered condition of the secretions of the os and cervix is the cause of sterility.

CASE XXXVI.—*Sterility the result of Cervical Leucorrhœa.*—Mrs. T—, a lady 35 years of age, had been married twelve years, and during the first five years of her marriage had given birth to three children, all of whom are living. My first attendance upon her was in 1852, when she had been seven years without the occurrence of pregnancy. Her last labor had been difficult and unusually painful, and she had nursed the infant for fifteen months. The result was that she fell out of health, became much emaciated, suffered a good deal of pain at the catamenial periods (the discharges at which were scanty), had frequent and violent attacks of hysteria, spinal neuralgia, great irritability of the stomach, and a profuse and constant leucorrhœa was present, which had continued without intermission from the date mentioned. When I saw her she was scarcely able to walk from debility, the os uteri was almost at the ostium vaginalæ, bathed in mucous, purulent matter, secreted abundantly by the canal of the cervix and the os and vaginal surface of the cervix, which were in a state of granular ulceration. The discharge was fetid, and from the febrile symptoms and the irritability of the stomach and bowels, I have no doubt that liquor puris was absorbed into the circulation. The discharges were highly alkaline, and consisted under the microscope of scaly epithelial débris, plasma, and mucus- and pus-corpuscles. Under treatment, the leucorrhœa and the local disorder became greatly improved, but she still remained thin and delicate. As soon, however, as the leucorrhœa was controlled she became pregnant, and was in due time delivered. In

this case the sterility was evidently dependent upon the discharges, as in the case of a woman who had already borne children there would be no question of obstruction, or any organic impediment to the completion of the act of impregnation. It appears evident that either the ovule or the spermatic particles, or both, were unfitted for the process of fecundation, as, before any great change had taken place in the general health, she became pregnant after the arrest of the leucorrhœa, to which she had been subject during the whole period of the continuance of the sterility.

CASE XXXVII.—*Repeated Abortion, in connection with Leucorrhœa and Granular Ulceration of the Os and Cervix Uteri of a non-specific character.*—Mrs. H—— was sent to me by a medical practitioner under the following circumstances. She was thirty years of age, and had been married about eight years. The cata menia appeared at thirteen, and up to the date of her marriage, she had been quite regular and in good health. She became pregnant soon after her marriage, and was delivered within the year. She had a difficult labor, and the child, a boy, was still-born. She recovered from her lying-in favorably, and three months afterward became pregnant a second time, and miscarried between the third and fourth months. This miscarriage was preceded by pain in the back, muco-purulent leucorrhœa, and occasionally discharges of blood. She appeared to have fallen into ill health from becoming pregnant so soon after the first delivery. From this time she went on aborting, and in all she had fourteen abortions between the third and fifth months of pregnancy. On one occasion pregnancy went on to the thirty-eighth week, but the child was still born. Thus in all she had sixteen conceptions in a space of eight years, none of which produced a live child. On each occasion she had lost a good deal of blood before and after delivery, and had been the subject of constant leucorrhœa. When I saw her, she was reduced to a state of extreme debility. The skin was excessively blanched, the tongue white and fissured, the legs œdematosus to the knees. The loss of blood had been so irregular that she could not make out the monthly periods with any accuracy : she suffered much from palpitation of the heart, giddiness, dimness of sight, throbbing of the temples, and all the signs of great loss of blood. Her pulse was irregular, and the venous murmur was very distinct in the jugulars. Upon making

an examination internally, I found the uterus large and patulous, admitting the finger readily into the cavity of the cervix, the os uteri and vaginal portion of the cervix entirely denuded of epithelium, the canal of the cervix everted, and the cervical follicles secreting abundantly. The internal organs were almost white from deficiency of blood. I treated her locally and constitutionally, and as her state was one of positive danger, I directed separation from her husband for a year. She slowly regained her strength, the local disorder became relieved, and she was regular, but lost a small quantity of pus or muco-purulent discharge after each period. When she left London she was tolerably well, but I have not since heard whether any further abortion has taken place. In this case no evidence of any syphilitic taint could be obtained, nor were there any signs whatever of any such condition. Her repeated abortions appeared to depend entirely upon constitutional debility and the local disorder of the os and cervix uteri. Case XXV. (page 144), was also a case of the same kind, and I have met with others running a similar course.

CASE XXXVIII.—*Abortion in connection with Leucorrhœa and Prolapsus Uteri.*—Mrs. R. —, a lady, aged thirty-two, who had resided many years in India, gave birth to her last living child eleven years ago. She was married at fifteen, and had three children before she was twenty-one. In her last labor there was a good deal of flooding, and the child was dragged out by the feet by the Hindoo midwife in attendance. From this time she had suffered constantly from leucorrhœa, pain in the back, bearing-down, and other local symptoms of uterine disorder. No great constitutional disturbance has been produced; indeed, she has become plethoric, her height being five feet three inches, and her weight thirteen stone. She has preserved this weight, or nearly so, for several years. Since the birth of her last child she has aborted five times, the last miscarriage occurring about a year ago. The abortions have all taken place at about the fourth month of pregnancy. In this case, the catamenia were regular but scanty; there was prolapsus uteri, with profuse cervical muco-purulent leucorrhœa, induration of the os uteri, and abrasion of the epithelium to a considerable extent. I gave her the liquor potassæ, scarified the os uteri freely once a week for several weeks, ordered an injection of tannin

and alum, and a sponge pessary to be worn during the day. Under this treatment she improved, and I sent her to the sea-side, since which she has been in good health, and has diminished in weight. In this case, the fecundity and abortion would seem to have been ruled by the local disease, as, after the commencement of the leucorrhœal discharge, she became impregnated much less often than before, and when conception did occur, it was followed by abortion.

It may seem paradoxical to treat of leucorrhœa as the cause of sterility in some cases, and of abortion in others. Still, there is no doubt that the two classes of cases occur in practice. Nor is there any difference which can positively be detected in the discharges or the local symptoms, in cases of leucorrhœa accompanied by sterility, and in those attended by the ordinary aptitude for impregnation. Possibly, it may be that in some cases of leucorrhœa not affecting fertility, of apparently equal severity with others in which sterility is the result, the discharges may not be so acrid or injurious to the spermatic particles; or, in some instances, the spermatozoa themselves may be less easy of destruction. But whatever the explanation, the fact is indubitable.

CHAPTER XI.

THE CONSTITUTIONAL AND LOCAL CAUSES OF LEUCORRHœA.

THE causes of uterine disorders, and especially those connected with leucorrhœa, have never received so much attention as during the last twenty years. In this period, the tendency has undoubtedly been to look too exclusively to local lesions and local causes of disorder. Some writers have protested energetically against this predisposition, and none have done so more ably than Dr. Mackenzie, in his papers "On the Relations of Uterine to Constitutional Disorders." We must, however, guard against the very possible mistake of falling into the opposite extreme. We shall greatly err, if we give undue prominence either to the local or the constitutional causes of these disorders. It is but seldom that, in any given case, local and constitutional agencies do not concur to produce leucorrhœa. This must be sufficiently evident, when we consider the many local conditions favorable to the production of disease, to which the uterine system is liable, and the degree to which this system is affected by constitutional states. The changes, as regards innervation and vascular supply, through which the uterus passes at every monthly period, from the advent of puberty to the date of the catamenial climacteric; the influence of sexual excitement and sexual intercourse; the various phases of pregnancy, labor, and suckling; may all constitute local predispositions to disorder, with which any constitutional tendency to ill health is pretty sure to ally itself. On the other hand, there is scarcely any organ which more readily and responsively sympathizes with the constitutional changes of health and disease in the body generally, than the uterus.

The following are some of the principal Constitutional Causes of Leucorrhœa.

Plethora.—Women who are approaching the catamenial climacteric, who live highly, and in whom the monthly loss begins to grow

less in quantity, are very prone to leucorrhœal affections. Such women generally suffer from hemorrhoids, and the canal of the lower part of the rectum is diminished in calibre by vascular fulness, to such an extent as to interfere with defecation. The liver in these patients is loaded, and secretes inefficiently. There is fulness of the portal, renal, and hemorrhoidal vessels, and the kidneys and the cervix uteri appear, by their increased secretions, to compensate in some degree for the inactivity of the bowels and the diminution of the catamenial secretion. This cause of leucorrhœa in such women, in whom the gouty diathesis is generally present, has never been better described than by Sir Charles Clarke.

Debility.—The opposite condition, that of debility, is also a frequent cause of leucorrhœa. Excessive loss of blood from any cause, impoverishing diet, depressing mental emotions, and whatever lowers the tone of the general system, is extremely prone to produce this discharge. The excitability of the glands of the cervical canal, varies greatly in different subjects. In some women, strong mental emotion, a ride on horseback, or a longer walk than usual, is sure to be followed by leucorrhœal discharge. In some, again, the occurrence of a catarrh affects the cervix uteri as certainly, as in others it affects the throat and nares. Such females get an attack of leucorrhœa every time they take cold, the affection being in this instance literally uterine catarrh. In others, a fit of indigestion is sure to be accompanied by temporary leucorrhœa.

Prolonged Lactation.—Among the causes of leucorrhœa, undue lactation must not be omitted. In hospital practice, nothing is more common than to find poor women with children above a year old, suffering from profuse mucous leucorrhœa, as well as the drain of lactation. Such women suffer all the symptoms which would result from direct loss of blood: throbbing headache, palpitation, faintness, loss of appetite, and indigestion, with extreme pallor and emaciation. The same thing frequently happens in private practice, in delicate women, to whom the claims of society render prolonged nursing as great a source of exhaustion, as it is in the laborious and ill-fed. Some women bear nursing so badly that we cannot measure the mischief caused by lactation by the time during which it has been persevered in. In certain cases, the health is as much deranged by three months' nursing as it would be three years in other habits. The leucorrhœa of lactation seems to be chiefly

caused by the suspension of menstruation, the direct debility induced by suckling, and the reflex irritation of the uterus by the mammary excitement.

The Strumous Habit.—It was noticed by Sir Charles Clarke, that women in whom the glandular system is more active than usual, are very liable to be affected with leucorrhœa. Simple cervical discharge, or excessive mucous secretion of the glands of the canal of the cervix uteri, arises more frequently in women of lymphatic or strumous temperament, than in any other variety of constitution. In such women, the glands of the cervical canal are stimulated by causes which in other habits exert no influence. Some of the most severe and intractable cases met with in practice, are found among women in whom scrofulous disease of the glands or joints exists, or in whom the scars of strumous ulceration in childhood are observable. Leucorrhœa is also common in consumptive patients.

Skin Diseases.—Some of the most obstinate forms of leucorrhœa and disorder of the os uteri met with in practice, arise in women suffering from chronic skin disease. Eruptions similar to those found upon the skin cover the os uteri, and frequently the whole of the vagina. Cases of this kind have several times been referred to in the preceding pages.

Influence of Climate.—Climate has always been referred to as a cause of leucorrhœa, and this disorder has often been considered to prevail more in Holland than in other European countries. Its prevalence among the Dutch has been attributed to the damp atmosphere, and to the *chauffe-pieds* used by the women. Leucorrhœa is very common in Russia, where the winters are chiefly passed in rooms heated to a high temperature by stoves. It is also remarkably frequent in Englishwomen who have lived in hot climates. Through the kindness of Mr. J. R. Martin, I have seen numerous cases of tropical invalids, many of whom have suffered from great relaxation of the uterus and vagina, and profuse leucorrhœal secretion. Other uterine disorders are very common in women of European constitution who pass many years in India or in other hot climates. In the pathology of warm climates, the uterine system in women assumes almost an equal importance with the hepatic system in men. The relaxing effects of tropical temperature lead to inversion of the vagina, prolapsus, and procidentia, the different forms of the uterine version and flexion, uterine inertia during

labor, with great relaxation of the soft passages, flooding after delivery, menorrhagia, and cervical leucorrhœa. One of the most singular effects of climate upon the uterine functions, is a circumstance noticed by Mr. Martin, namely, that in the sea passage to India by the Cape, great numbers of women, the married and the unmarried alike, suffer from amenorrhœa during the whole of the voyage. Upon landing, they soon become regular. I have seen many instances of this form of suspended menstruation. The effects of a marine atmosphere upon the catamenial secretion extend, in some habits, to a residence by the sea-side. During the past year I had to treat a lady who became amenorrhœal during a summer sojourn at one of the islands on the western coast of Scotland; the lady herself, her sister, and their two maids, were all similarly affected. As an instance of the effects of a hot climate in causing uterine relaxation, I may mention that the remarkable case of hemorrhage and inversion of the uterus, in which transfusion was performed by Mr. Soden, at Bath, and which is recorded in the thirty-fifth volume of the "Medico-Chirurgical Transactions," occurred in the person of a lady who had lived in India. She was afterwards under my care for leucorrhœa, and since her return to India, she has had two labors, both of which have been attended by dangerous floodings, in spite of every precaution which could be taken to prevent hemorrhage. Leucorrhœa and uterine displacements are, I have been assured by American physicians, still more common in the United States than with us; and some of the worst cases of leucorrhœa I have met with have occurred in patients who have resided in South America, Australia, and India. In India especially, the treatment of uterine disorder is, from its frequency, one of the most important that falls to the practitioner in the treatment of European constitutions.

The following includes the chief Local Causes of Leucorrhœa.

Rectal Irritation.—This is highly important as a cause of leucorrhœa. In habitual constipation, when the rectum is constantly filled with hardened faeces, the lower part of the uterus is subject to continual irritation. In the irritation of the rectum by ascarides, leucorrhœa occurs from the extension of irritation from the lower bowel to the uterus. Some of the most obstinate cases of leucorrhœa are caused by these worms, and it often happens that patients who suffer from them do not mention their existence, unless the

matter is inquired into. Hemorrhoidal tumors also excite irritation of the uterus, and are sometimes accompanied by a dilated or varicose state of the veins of the neck of the womb. In the same way, leucorrhœa may be produced in persons who take aloes habitually as an aperient. Leucorrhœa is also frequently found in connection with fissures at the margin of the anus.

Vesical and Urethral Irritation.—The influence of irritation of the bladder and the urethra upon the uterus, in exciting leucorrhœa, is not so marked as irritation of the rectum, but it is tolerably constant. In almost all cases of disorder of the female urinary organs, some amount of uterine irritability, and very frequently leucorrhœa, is present. This is particularly the case with the painful vascular tumor of the meatus. Persons suffering from this affection most commonly apply, in the first instance, for the relief of the leucorrhœal disorder. As in the case of the rectum, the bladder affects the uterus partly in consequence of vascular contiguity, and partly through a nervous reflex influence.

Vaginal and Uterine Irritation.—The local irritations connected with the vagina and the uterus itself, which produce cervical leucorrhœa, are excessive coitus; prolapsus and procidentia uteri; retroversion and retroflexion, anteversion and anteflexion; improper habits of excitement; the development of tumors in the cavity, walls, or superficies of the uterus; polypus of the uterus; tuberculous disease of the uterus; and the commencement of uterine cancer. To the conditions of the organ depending on pregnancy, abortion, parturition, or lactation, as causing leucorrhœa, I shall refer separately. With respect to one of the causes of leucorrhœa enumerated above, I would observe that in cases caused by excessive self-abuse, I have generally found the abdomen shrunk, and almost cup-shaped. The os uteri is generally low in the vagina, and œdematosus, the anterior lip being especially prominent, and thin at its most projecting portion. Both these symptoms, and indeed the leucorrhœa itself, probably depend in part on the local irritation and on the general emaciation and feebleness of the uterine organs, caused by this habit when excessive and long continued. With respect to the influence of polypoid growths in causing cervical leucorrhœa, it may be observed, that in cases of polypus of the fundus, where the morbid growth descends through the os uteri, or in cases where polypi spring from the os and cervix, the cervical glands are always stimu-

lated to such an extent as to cause leucorrhœa. In either case the cervical discharge is mixed with the secretions from the surface of the morbid growths. Of the influence of uterine displacement in causing leucorrhœa, there can I think be no doubt. Whenever the unimpregnated uterus is displaced to any considerable extent, the nutrition of the organ is almost invariably affected, and it becomes congested and increased in bulk. Leucorrhœa and menorrhagia are very common results of such a state of things. In complete procidentia, the uterus is commonly increased much beyond the natural size, and the mucous secretion of the cervical glands is generally profuse, and the margin of the os uteri is excoriated by the discharge. Here the irritation of the external air is a great cause of the leucorrhœa. In prolapsus also, the uterus is usually larger than natural, and there is increased discharge from the cervix, owing to the irritation of the lower part of the uterus by the vagina and its secretions. In the other forms of uterine displacement, particularly in retroversion, cervical leucorrhœa is an almost constant accompaniment.

Gestation.—To the leucorrhœa which is so common in pregnancy I have formerly referred. During gestation, the functions of the cervical mucous glands are exalted physiologically. The arrest of the catamenia, and the vascular fulness and increased vitality of the uterine system incidental to pregnancy, and particularly the development of the cervix, sufficiently explain the frequency of leucorrhœa as a complication of pregnancy.

Abortion and Labor.—We can easily understand that after severe abortions, and after difficult or prolonged labors, leucorrhœa should frequently arise. The cervix uteri is stimulated to the utmost by the enormous distension it has to undergo in the passage of the child's head; it is, moreover, of necessity, frequently bruised or lacerated to a slight extent; and after delivery or abortion, the uterus has to undergo great changes in returning to the size of the unimpregnated organ. This process of devolution is necessarily attended by discharge. It is not surprising that leucorrhœa attended by abrasion of the os and cervix, frequently lasting for years, should originate out of these various circumstances.

I have already referred especially to the influence of Secondary Syphilis, Gonorrhœal Inflammation, and the chief derangements of the Catamenial Function, as causes of leucorrhœal disorder. These,

some of which are constitutional and others local, include a large proportion of leucorrhœal cases.

Leucorrhœa in Children.—In children and infants the so-called leucorrhœa consists almost entirely of a discharge from the glands of the vulva, these parts being more developed in them than the rest of the sexual organs. It is caused chiefly by constipation, ascarides, neglect of cleanliness, and other local causes. It sometimes occurs as a manifestation of strumous disorder. Some children suffer much from this discharge during dentition, the irruption of almost every tooth being accompanied by inflammation of the vulva, with profuse mucous or muco-purulent secretion. My friend, Dr. Robert Barnes, has drawn attention to a form of leucorrhœa in young children, accompanying scarlet fever and small-pox; and occasionally discharge from the vulva has been observed as an epidemic. In hospital practice I have met with several cases in which profuse discharge from the vulva, accompanied by acute inflammation, has been communicated when the father or mother has suffered from gonorrhœa. In these cases, the use of towels or water contaminated by gonorrhœal matter has generally been the means of infection.

Causes of Vaginal Leucorrhœa.—The constitutional and local causes of vaginal discharge are very much the same as the causes of cervical leucorrhœa; but the vagina is more readily influenced by some of these causes than the lower part of the uterus, while from others it is comparatively free. Thus the vagina is more liable than the cervix uteri to be affected with acute and catarrhal inflammation, and it suffers more from the mechanical irritation of coitus, and from the inflammation of gonorrhœa. Immediately after each menstruation, there is a partial desquamation of the epithelial surface of the vagina, attended by a greater secretion of mucous plasma than occurs at other times, but this is a physiological rather than a pathological condition. In certain diseases of other parts of the body, there is a special tendency to vaginal irritation and discharge. This is particularly the case with respect to disorders of the lungs. I have many times seen phthisical patients suffering from complete desquamation of the epithelial coat of the vagina, the granular surface beneath, formed chiefly of inflamed and denuded papillæ, secreting profuse quantities of pus and mucus.

From the whole tenor of the present work, it will be seen that I

differ very strongly from the opinions which refer almost all the conditions upon which leucorrhœa depends, to inflammation of the os and cervix uteri. I believe it cannot now be disputed that many of the affections of the os and cervix recently stated to constitute ulceration of the surface, are, in reality only epithelial abrasions of more or less completeness. As regards ulceration, I believe the more searching examinations, to which its asserted frequency has led, prove that its importance and frequency are much less than were formerly asserted. A modified view of the lesions supposed to constitute ulceration of the os and cervix uteri, must certainly be taken ; and in a former chapter I have stated the grounds upon which I believe that abrasions and superficial ulcerations of the os and cervix uteri, when they occur, are very frequently secondary affections, instead of primary disorders. In like manner, I believe the vaunted importance of inflammation, as the great cause of uterine disorder, must be altogether modified. I think the term "Epithelial Abrasion" should, in the great majority of cases, take the place of "Ulceration;" and I believe that the words "Irritation" or "Relaxation," should generally take the place which has been assigned to "Inflammation." The changes in the uterus, and the increased secretions of the uterus and vagina, found in cases of leucorrhœa, are not such as attend inflammation in other parts of the body. It is not after an attack of acknowledged metritis that leucorrhœa is most prone to occur. The discharge generally comes on in so slow a manner that its advent cannot often be referred to any particular date. No doubt in some cases—as after suppression of the cata menia from cold or imprudence, after abortion or parturition, or mechanical injury—a genuine inflammatory state lays the foundation of leucorrhœa, but the leucorrhœal discharge and the local irritation constantly remain long after the signs of positive inflammatory disease have passed away. Chronic irritation and relaxation, rather than chronic inflammation, is the state which generally obtains under these circumstances. The most common and immediate cause of leucorrhœa, is simple irritation of the glands of the cervical canal, and many of the conditions described as inflammatory, such as abrasions and indurations of the os and cervix uteri, are, as I have repeatedly observed, the results of the long-continued discharge, rather than of any inflammation occurring in the os and cervix as a primary affection.

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less in quantity, are very prone to leucorrhœal affections. Such women generally suffer from hemorrhoids, and the canal of the lower part of the rectum is diminished in calibre by vascular fulness, to such an extent as to interfere with defecation. The liver in these patients is loaded, and secretes inefficiently. There is fulness of the portal, renal, and hemorrhoidal vessels, and the kidneys and the cervix uteri appear, by their increased secretions, to compensate in some degree for the inactivity of the bowels and the diminution of the catamenial secretion. This cause of leucorrhœa in such women, in whom the gouty diathesis is generally present, has never been better described than by Sir Charles Clarke.

Debility.—The opposite condition, that of debility, is also a frequent cause of leucorrhœa. Excessive loss of blood from any cause, impoverishing diet, depressing mental emotions, and whatever lowers the tone of the general system, is extremely prone to produce this discharge. The excitability of the glands of the cervical canal, varies greatly in different subjects. In some women, strong mental emotion, a ride on horseback, or a longer walk than usual, is sure to be followed by leucorrhœal discharge. In some, again, the occurrence of a catarrh affects the cervix uteri as certainly, as in others it affects the throat and nares. Such females get an attack of leucorrhœa every time they take cold, the affection being in this instance literally uterine catarrh. In others, a fit of indigestion is sure to be accompanied by temporary leucorrhœa.

Prolonged Lactation.—Among the causes of leucorrhœa, undue lactation must not be omitted. In hospital practice, nothing is more common than to find poor women with children above a year old, suffering from profuse mucous leucorrhœa, as well as the drain of lactation. Such women suffer all the symptoms which would result from direct loss of blood: throbbing headache, palpitation, faintness, loss of appetite, and indigestion, with extreme pallor and emaciation. The same thing frequently happens in private practice, in delicate women, to whom the claims of society render prolonged nursing as great a source of exhaustion, as it is in the laborious and ill-fed. Some women bear nursing so badly that we cannot measure the mischief caused by lactation by the time during which it has been persevered in. In certain cases, the health is as much deranged by three months' nursing as it would be three years in other habits. The leucorrhœa of lactation seems to be chiefly

parations increase the loss, if given during the periods, but are of great use during the intervals. In cases of leucorrhœa combined with amenorrhœa in feeble habits, and in periodical leucorrhœa, the preparations of steel are the only medicines which can be relied upon, the re-establishment of the catamenia being the surest method of removing the leucorrhœa.

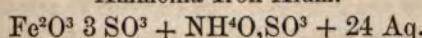
Iron Alums.—A combination of alum and iron has long been used in the treatment of leucorrhœal disorders. The efficacy of the Sand-rock chalybeate water, in the Isle of Wight, in these affections, is tolerably well known. This spring is powerfully impregnated with sulphate of iron and sulphate of alumina, upwards of forty-one grains of the former and thirty-one of the latter being contained in every pint. At the commencement of the present century, this water was extensively used by Dr. Saunders and by several physicians engaged in the treatment of uterine disease, having been introduced to the notice of the profession by Mr. Waterworth, of Newport, whose excellent accounts of the spring and its medicinal properties have been lately republished by his son. From the analysis of Dr. Marcket, it would appear that the sulphate of iron and alumina are not in chemical combination, but are simply dissolved together in the water. The springs of Hartfell, in Scotland, and Horley-green, in Yorkshire, and several springs on the Continent, have a similar composition, but are less powerful than the Sand-rock water. There can be no doubt of the curative effects of this water, and it is still resorted to in various diseases of relaxation and debility, and is exported in considerable quantities to India and other warm climates. My friend, Mr. J. R. Martin, has always used it extensively in the disorders of females on their return from tropical climates, particularly in cases of leucorrhœa and menorrhagia.

In imitation of this mineral water, I was in the habit of prescribing for my hospital patients a mixture of sulphate of iron and common alum in water, in the proportion of from two to five grains of each, dissolved in water, two or three times a day, with very good effect, when I learnt from Mr. Lindsey Blyth, the late dispenser at St. Mary's Hospital, who is a most excellent pharmaceutical chemist, that Mr. Davenport had placed some beautiful crystals of a preparation of iron alum in the Great Exhibition in the year 1851. This preparation was obtained in a casual manner by Mr. Davenport from a solution of persulphate of iron. At my request, Mr.

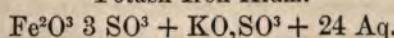
Blyth procured some of this salt, and in 1852 I began to administer it in cases of leucorrhœa, prior to which I believe it had never been used in medicine. I found it remarkably efficacious, and have constantly prescribed it since that time. I certainly do not know of any other internal remedy which at all equals it in leucorrhœa. Since I began to use it, it has been employed by my colleagues, and by other physicians, but sometimes other compounds have been used under the name of iron alum. Dr. Bence Jones, for instance, in a lecture in the *Medical Times* (Nov. 12, 1853), stated that he had used iron alum with good effect, having obtained it from Mr. Morson, of Southampton Row. From an inquiry of Mr. Morson, I found the preparation he had supplied was merely a mixture of sulphate of iron and sulphate of alumina and potash, and not the true iron alum.

The genuine iron alum contains no alumina whatever. There are two preparations of iron alum, one of them is a double sulphate of potash and iron, and the other a double sulphate of ammonia and iron. In some papers "On the Constitution of the Various Alums," presented by Mr. Blythe to the Pharmaceutical and Chemical Discussion Societies, he has entered minutely into the history and formation of these salts. Taking the common alum, the double sulphate of potash and alumina, as the standard, a variety of other bases may be made to replace the alumina, the result being the formation of salts having the same form of crystals and the physical properties of common alum. This is the case with iron, ammonia, chrome, manganese, and some other bases. It was on this series of salts that Mitscherlich founded his beautiful theory of Isomorphism. There are two iron alums, one being a double sulphate of the protoxide of iron and potash, the other a double sulphate of the protoxide of iron and ammonia, but as these designations are lengthy, they may be prescribed more conveniently as the ammonia iron alum, or as the potash iron alum. The following formulæ exhibit the composition of these two salts :—

Ammonia Iron Alum.



Potash Iron Alum.



In appearance and taste these two alums cannot be distinguished

one from the other. Both may be obtained in large octohedrons, having a pale violet tint. The potash iron alum is made by dissolving peroxide of iron in sulphuric acid and adding an equivalent of sulphate of potash, the solution with an excess of sulphuric acid being evaporated until crystals form on cooling. In making the ammonia iron alum, sulphate of ammonia is added to the solution of the peroxide of iron, instead of sulphate of potash. Both these salts are more soluble than the common alum, and the ammonia iron alum is the most soluble of the two.

I have prescribed the iron alum with ammonia, which I now prefer, in most cases, to the similar salt with potash, because of its greater solubility, in doses of from three to six grains, in infusion of calumba, or in simple water, with some warm tincture, three times a day. It is similar in its action to the sesquichloride of iron; but while it is equal to, or perhaps more effective than this medicine as an astringent, it is less stimulating, more easily assimilated, and seldom causes any nausea or headache. It generally produces a slight tendency to constipation, which may be obviated by an occasional aperient. From its astringent action on the bowels it has been found useful in choleraic diarrhoea, dysentery, and other disorders in which tone and astringency are required.

Tonics.—It may seem a work of supererogation to enumerate the tonics found useful in leucorrhœa. The mineral acids, especially the hydrochloric or nitro-muriatic acids in quassia or calumba are often of great use. These acids act as tonics and astringents, improving the general health, and at the same time diminishing the discharge. Quinine, the preparation of bark, and the other vegetable bitters, are very valuable when the digestive powers have been deranged by the long continuance of the discharge. Quinine, in full doses, is also very useful in cases of uterine neuralgia or irritable uterus. Gallic acid is frequently of great service as a tonic and astringent; so also are the oxides of zinc and silver. As a general rule, all tonics being to some degree astringent, it may be said that those tonics are most useful in leucorrhœa which are most astringent in their action. In strumous habits, the iodide or bromide of potassium, with cod-liver oil, may be given with great advantage, but these are alteratives rather than tonics.

Purgatives.—There are certain cases of leucorrhœa in which purgatives or aperients are eminently useful. They are of great service, for instance, in women of plethoric habit, where leucor-

rheal discharge exists in combination with, and is often in great part caused by, fulness of the abdominal and pelvic vessels. They are also of importance in leucorrhœa occurring in the gouty diathesis, and in women who live luxuriously and take little exercise. Under these conditions, a course of purgative medicine is often one of the most important points of treatment. Such cases are frequently found among women who are approaching, or who have just passed, the catamenial climacteric, and in whom the monthly secretion has become scanty or irregular, or has entirely ceased. In other subjects in whom habitual constipation is present, the uterus, and particularly the os and cervix, are constantly irritated by the presence of hardened faeces in the rectum. Here also it greatly aids the employment of other remedies to empty the rectum daily, so as to free the uterus from this kind of mechanical irritation. The sympathy or synergy between the rectum and the uterus must not be forgotten in the treatment of any case of leucorrhœa. Irritation of the uterus almost always either acts as a counter-irritation, and diminishes the tone of the lower bowel, or else it irritates the latter in a direct manner. The state of the rectum in either case reacts upon the uterus. The consent between the uterus and the rectum is seen upon many occasions. At the commencement of each monthly period there is in most women looseness of the bowels for a day or two, and a tendency to constipation after the period has ceased. Sexual excesses are generally attended by constipation. The relaxation of the bowels which precedes delivery, and the constipation which exists for some days after labor, are well known. In leucorrhœa, constipation is the general rule, though cases are occasionally met with in which the state of the cervix uteri irritates the rectum and causes diarrhoea.

The choice of a purgative in leucorrhœa is a point of some importance. Whether we give aperients to diminish abdominal or pelvic fulness, or to remove rectal accumulations, we should, as the rule, avoid aloes, and all the numerous preparations into which this drug enters. We cannot give an aloetic purge without irritating the hemorrhoidal vessels directly, and the uterine vessels indirectly, and so increasing the leucorrhœal discharge. In profuse leucorrhœa in ordinary subjects, aloetics are as distinctly contra-indicated as they are in menorrhagia. Leucorrhœa is very common in women who take aloes habitually. The only cases of leucorrhœa in which

I consider aloes admissible, are in chlorotic females in whom torpor of the rectum, ovaria, and uterus exist together, and in whom the leucorrhœa, depending upon relaxation of the cervical glandular structures, is of less importance than the suspension of the cata-menia. In cases of leucorrhœal discharge combined with plethora, scanty menstruation, or the gouty diathesis, the aim should be to increase the secretions of the whole intestinal canal; but in cases of mechanical irritation from the presence of fæces in the rectum, their constant removal is the chief object to be held in view. In leucorrhœal discharge combined with plethora, a condition often marked by want of power, a combination of the sulphate of magnesia, quinine, and iron, is often very useful. These cases require an occasional dose of calomel or blue pill, and alkaline remedies, combined with colchicum, if the gouty temperament is present. In this and the other forms of leucorrhœa, aperients should be selected from the neutral salts, rhubarb, colocynth, senna, the nitro-muriatic acid, &c., according to the peculiarities of the patient. In cases of simple torpor of the rectum, a daily enema of cold water, or salt and water, is frequently better than any purgative medicine; and in cases of leucorrhœa in connection with ascarides, we must very much depend on the daily injection of salt and water, the infusion of quassia, or the compound decoction of aloes.

Injections.—Vaginal injections have been somewhat decried of late years, on account of the inflammatory theory of uterine disease; but in my opinion any practitioner who declines to resort to them in cases of leucorrhœa, deprives himself of a very valuable aid to treatment. As formerly used with the cylindrical glass or metal syringes, containing an ounce or two of fluid, they could not have been as effectual as they may now be made by the use of better instruments. Properly managed, a vaginal injection should produce its effect upon the whole of the vaginal canal, the vaginal surface of the cervix uteri, and the os itself. Probably, in the ordinary state of the aperture of the os uteri in women who have not borne children, very little, if any, of the fluid used as an injection can ever enter the canal of the cervix; but in women who have had families, and in many cases of leucorrhœa, the os uteri is open to a certain extent, so as to admit the entrance of fluid; and in some cases the lower part of the cervical canal is, as I have shown, everted, so that a vaginal injection is without any difficulty brought into direct con-

tact with the glandular mucous surface of the lower part of the canal. All the substances usually resorted to for vaginal injections coagulate the albuminous leucorrhœal discharges, whether they proceed from the vagina or the uterus. The first effect of an astringent injection is to coagulate all the leucorrhœal secretion with which it comes in contact ; and in cases where the amount of secretion is large, the coagulated albuminous matter generally comes away during and after the injection ; but in some instances the mucous or muco-purulent discharge is coagulated day after day by the use of vaginal injections, and remains in the canal until at length it comes away in egg-shaped masses of tannate of albumen, of considerable size. Of course the astringent effect expended on the coagulation of the albuminous secretion can have no influence on the uterus or vagina, but if a sufficient quantity of astringent matter is used, the discharge is first coagulated ; and then the whole surface of the vagina, the vaginal portion of the cervix, and the cervical canal to some extent, are astringed. Besides its direct effect in restraining in this way the profuse secretion of the utero-vaginal mucous membrane, an injection gives tone to the muscular coat of the vagina, and by raising the os and cervix, has an important indirect effect in the cure of leucorrhœa.

Another mode in which injections are useful in leucorrhœa, is by the influence they exert in contracting the os uteri. An astringent injection tends to diminish the calibre of the cervical canal by virtue of its astringency. But beyond this a cold or even a tepid injection excites contraction of the muscular fibres contained in the cervix. I am confident that the contractile power of the cervix in the unimpregnated state has been much underrated. I have seen it embrace the uterine sound quite firmly, and I have seen it expel a sponge tent by an active contraction. If the effort to bear down is made while the speculum is introduced, the os uteri may be seen to diminish in size in some women. Inversion of the unimpregnated virgin uterus has taken place from dysmenorrhœa, and I have no doubt that much of the pain in some cases of dysmenorrhœa is dependent upon a tenesmus of the os uteri. In the treatment of leucorrhœa by injections, this motor power is brought into beneficial operation. It is most marked in women who have borne children, but it is by no means confined to them.

The injection which I have found most useful in cervical leucor-

rhœa is a solution of alum and tannin : 3*j* to 3*ij* of tannin and 3*ss* of alum dissolved in a quart of water, is the strength I generally prescribe, directing one half to be used at night and the other in the morning. Mr. Morson has prepared a tannate of alumina, a chemical compound of tannic acid and alum, which is useful both as a medicine and as an injection ; it requires, however, the addition of a little dilute sulphuric acid to render it soluble in water, whereas the sulphuric acid contained in common alum is sufficient to insure the solution of powdered tannin and alum in water. This renders the prescription of alum and tannin in powder the most convenient for patients, but for internal administration, Mr. Morson's salt is a very elegant preparation. I generally recommend, where the discharge is profuse, the injection of a considerable quantity of cold or tepid water before the use of the astringent solution, with a view to clear the vagina and the os and cervix uteri as much as possible from discharge, when, as already mentioned, the injection acts more efficiently. This injection, continued for two or three weeks, will scarcely fail to make an impression on the most profuse and long-continued discharge. Occasionally an astringent injection of this strength causes pain when first used ; when this is the case, it should be diluted so as to avoid pain, and be gradually increased in strength.

Solutions of sulphate of iron and sulphate of zinc, iodine, the diacetate of lead, and a variety of other medicinal substances, are recommended as astringent injections in leucorrhœa, but they are none of them equal to the tannic acid and alum. Sometimes, however, when the more powerful astringents fail, after a time, of their effect, it is very useful, as Dr. Ashwell has pointed out, to alternate from one injection to another. In leucorrhœa attended by pain, the lead injection, combined with opium, is especially useful. The decoction of oak bark and alum was long the standard injection ; but the oak bark, and tormentilla, which is also sometimes used, are only efficacious from the quantity of tannin they contain ; and it is better to use the tannin itself in solution than these decoctions. Injections of cold water simply, in considerable quantity, are often of great value in giving strength to the vaginal walls and the lower segment of the uterus, and in this way contributing to restrain excessive secretion. A solution of the nitrate of silver, injected in small quantities, has been a favorite remedy since the time of Dr.

Jewell, and it is undoubtedly a powerful astringent; but as there is no sufficient object, in cervical leucorrhœa, in applying it to the vaginal walls, I consider, when the substance is used, it should be applied in solution, or the solid form, directly to the surface intended to receive it. Dr. Fleetwood Churchill states that he has repeatedly seen menorrhagia produced by injections of the nitrate of silver. Whenever a solution of the nitrate of silver is used, it should be applied through the speculum. When it is used by patients themselves with a sponge and a glass tube, it is, I suspect, more often applied to some part of the vaginal surface than to the os and cervix uteri.

As regards the mode of using vaginal injections, the old-fashioned tubular glass and metallic syringes ought to be discarded altogether, except in cases when a powerful remedy is employed, and the effect is intended to be limited to the vagina. As far as the uterus is concerned, injections are well-nigh useless, unless a copious and continued stream is directed against the os and cervix. Any enema syringe, to which a vaginal tube has been adapted, will serve very well for ordinary vaginal injections. The very ingenious syringe invented by Dr. Evory Kennedy, if made of vulcanized India-rubber, is an excellent instrument for the purpose. By this syringe any quantity of fluid may be used. In some respects, however, the cylindrical pump syringe, made of India-rubber, and acting upon the same principle, is still more convenient than Dr. Kennedy's instrument. Any quantity of fluid may be thrown up, and as less force is required to empty it at each contraction, it is not so fatiguing as the globular syringe. Another method of injection is the syphon douche, largely used in the country by Dr. W. Jones. This plan has long been used in Holland, where leucorrhœa is very prevalent, by the Dutch physicians; but its use was revived by the late Professor Kiwisch, who employed it extensively in the treatment of uterine disease, as well as in the induction of premature labor. No muscular effort is required in the use of the douche, but it is more cumbrous and formal than the other methods. A modification of the douche has recently been devised by M. Gariel, in which, after the introduction of the vaginal tube, a circular air-cushion is placed round the tube, just within the ostium vaginæ, and inflated with air, so as to prevent the free return of the injection. The fluid is let off by a small tap, and by this modification the vagina is kept full of fluid during the use of the injection. I have no doubt this modi-

fication is calculated to prove of much service in cases of menorrhagia, or in the floodings of cancer uteri, as a means of keeping astringent solutions or iced water in continuous contact with the lower part of the uterus. In the employment of any of these means of profusely injecting the vagina, great care should be taken when pregnancy exists, as any of them, and particularly the syphon douche, may bring on abortion. Several cases in which this accident has occurred have come to my knowledge. In common cases of cervical leucorrhœa, when the disorder consists chiefly in the excessive secretion of the mucous glands of the cervical canal, without any great loss of surface or alteration of structure, injections will almost always, combined with attention to the general health, restrain the discharge; and probably if vaginal injections of cold or tepid water, or some simple astringent solution, which is nothing more than internal bathing, were resorted to on the first appearance of vaginal discharge, confirmed cases of leucorrhœa would be much less frequent than they now are.

Caustic Application.—In this place I wish to say a few words on the use of violent caustics in the treatment of uterine disease, and particularly of the so-called ulceration and hypertrophy of the os and cervix uteri. One point appears to me to have been almost lost sight of in the use of these applications. The uterus has to pass physiologically through great changes of growth and development in the course of pregnancy, parturition, and the return of the organ to the unimpregnated state. Of all the changes which occur to the uterus during the evolution and devolution of the organ before and after delivery, those which occur in the os and cervix uteri are perhaps the most remarkable. In the great majority of patients who present themselves for treatment, it must not be forgotten, that the uterus will have at some future time to pass through these changes. This circumstance alone appears to me to furnish a very strong *a priori* argument against the use of caustics sufficiently strong to cause disorganization of the os and cervix uteri. My own opinion is, that the potassa fusa, the potassa cum calce, the acid nitrate of mercury, the chloride of zinc, and the actual cautery, are on this account rarely, if ever, admissible in the treatment of non-malignant disease of the uterus. It has been said that a hypertrophied cervix can be melted down by the use of these destructive agents; but this simply means that portions of the os and cervix

uteri may, like other soft tissues, be destroyed by caustic ; for it cannot be contended, that when violent escharotics are applied to the uterus, the morbid elements are alone affected, the proper structure of the organ remaining intact. The evils of such applications are, as it appears to me, some of them immediate ; others are remote. It is the fact, that in the use of these violent caustics, the death of the patient has been caused by perforation of the vagina behind the posterior lip of the uterus, and the occurrence of fatal peritonitis. Pelvic inflammation, ending in abscess, is another unfortunate result of this practice. I have also known death to occur from cutting off portions of a hypertrophied uterine lip with the knife. No doubt some practitioners apply the more heroic caustics with such care as to avoid any immediate risk ; but I doubt if it be possible, with the utmost caution, to prevent ultimate mischief. In Case X., page 75, I have related the instance of a lady treated by a very skilful practitioner, in whom the melting down of the os and cervix uteri was followed by extensive giving way of the cicatrices, upon the occurrence of pregnancy. I have seen other cases of a similar kind. I have also met with cases in which the firmest adhesions have formed between the os uteri and the vagina, after deep cauterizations. Three years ago, a patient came to me who had apparently suffered from leucorrhœa and hypertrophy of the cervix uteri for many years, and who at length, under the care of a practitioner of large experience in a distant colony, had had a prolonged anterior uterine lip excised, and the cervix uteri treated liberally with potassa fusa and potassa cum calce. This patient was seen separately by Dr. Locock and myself, and it was found that the os uteri had, in cicatrizing, completely adhered to the upper part of the posterior vaginal wall. The case was sent to England as one of carcinoma uteri ; but the appearances which were considered to indicate cancer really arose from hypertrophy, and the irregular cicatrizations consequent upon excessive cauterization. In this case the shape of the os and cervix uteri was entirely lost. The subject of it will probably never become pregnant ; she has not done so up to the present time ; but if she should conceive, the os uteri will have to be torn from the rectum. The upper part of the vagina is in much the same state as we sometimes find it after instrumental labors, in which sloughing and cicatrization have taken place. In other cases the os uteri has been completely closed by adhesive inflammation,

after the use of potassa fusa, rendering it necessary to puncture the os to relieve the uterus of retained menstrual fluid. One patient, suffering severely from long-standing scrofulous disease of the elbow and knee joints, and bearing the most extensive marks of scrofulous ulceration, came to me at St. Mary's Hospital, from the country, in whom the whole of the lower part of the cervix uteri had been removed by the frequent application of caustic potash, though the leucorrhœa had evidently depended on the constitutional disorder. I have at the present time an in-patient, in whom the whole of the lower part of the cervix was formerly destroyed by potassa fusa, but she still suffered from profuse leucorrhœa on her admission.

Such are some of the evils which follow the use of the more violent escharotics in the treatment of ordinary uterine disease. It may be asked, are there no positive advantages in their use, which outweigh the disadvantages of such accidents? In my opinion there is no good which can be effected by the more powerful caustics, which cannot be accomplished by the nitrate of silver, or by other means. It is true that, by the prolonged application of the nitrate of silver, loss of substance may be caused, but this is far less likely to occur with lunar caustic than with the more powerful escharotics. It is also true that some practitioners apply the more violent caustics so lightly that they do not exceed the milder medical action of the solid nitrate of silver, but in such cases it would be quite as well to use the safer remedy where a caustic is required.

The object to be obtained in the treatment of hypertrophy and enlargement of the os and cervix uteri, consisting either of fibrinous exudation, or the increased growth of the proper tissues of the os and cervix, is the resolution of the enlargement without any destruction of the normal tissues. The induration and increased development of the os and cervix, caused by the constant irritation of the cervical discharges, often disappears slowly, after the arrest of the discharge. In other cases, when the cause lies in the irritation of the lower part of the uterus by the vaginal secretions, as in cases of prolapsus, the induration is cured by supporting the uterus in its proper position by a sponge pessary, or some other support. In cases of chronic induration and enlargement, when there is little or no leucorrhœa, and where there is vascular fulness, occasional leeching is very useful. When the enlarged os and cervix is pale and indurated, the frequent use of a strong solution of iodine, ap-

plied with a camel-hair brush, is sometimes of great service. But in the worst cases of chronic induration and enlargement, I have found occasional scarifications, repeated at intervals of about a week, more valuable than any other means. The immediate effect of each scarification, that of taking blood directly from the uterus, is beneficial, and in the healing of the incisions some amount of contraction always take place. In this way I have often seen the cervix, in cases of excessive distortion from enlargement of the anterior and posterior lip, or the whole neck, gradually resume its natural shape and size. After labor, the os and cervix uteri are reduced in size physiologically, without any local interference; and in many cases of hypertrophy and enlargement in connection with leucorrhœa, the uterus resumes its natural size under the constitutional or local treatment which relieves the discharge. When this does not occur, the natural method of diminution or cure in such cases, by absorption, seems to be more closely imitated by the effect of scarification than by any other local treatment of which I am aware.

In cases of abrasion of the os uteri, or superficial ulceration, very great benefit is frequently derived from the use of the solid nitrate of silver. This is particularly the case in the red, vascular condition of the os, attended by loss of the epithelium, and excessive development of the villi, the whole forming a surface from which blood in some cases exudes with scarcely any intermission, and in others, is poured out copiously at the menstrual periods. A surface of this kind seems to be made up of a field of very minute polypoid growths. This state occurs in the married and the unmarried, and I have sometimes found it in connection with fibrous tumors of the uterus. Many of the cases of slow hemorrhage supposed to be lochial and continuing for weeks, or even months, after abortion or labor, are of this kind; and the bleeding surface may often be so modified by one or two applications of the nitrate of silver that no further loss occurs. I believe that after abortion and labor there is always shedding of the epithelium of the cervix and the margin of the os to such an extent as to leave it entirely abraded of epithelium. At least I have never examined a patient under such circumstances, in which I have not found this to be the case. Such a condition of parts may easily pass into a bleeding or pus-secreting surface. I have seen a case of this description, in which a sanguineous drain which had lasted without a day's intermission between five and six

months, never reappeared after one application of lunar caustic to the os uteri. I have tried nitric acid, strong solutions of iodine, and sulphate of copper, but none of them are equal to the nitrate of silver, in such cases. In the form of abrasion or superficial ulceration, attended by purulent or muco-purulent discharge from the abraded surface, the nitrate of silver is often highly useful, but it is not followed by the striking and immediate results which mark its use in the sanguineous condition. In the pus-secreting surface, the nitrate of silver may be changed with advantage from time to time for the solid sulphate of copper, or the sulphate of iron. The nitrate of silver should be applied every five or six days, and the salts of copper or iron more frequently in the worst cases. They should be applied freely to the whole of any surface that may be abraded, and to the internal surface of the cervical canal itself, until a healthier condition is induced, care being taken to arrest at the same time the discharge from the cervical canal, upon which I believe the state of the os uteri so much depends. In applying the nitrate of silver, the aim should be not to produce any slough or loss of substance. By passing it with moderate firmness two or three times over the abraded surface, the external film only is cauterized, and in the course of two or three days this comes off in skin-like flakes, and the surface beneath is left considerably healthier than the old surface. In the case of the vascular and bleeding form of abrasion, the delicate bleeding surface is often destroyed, and no more bleeding occurs. In the case of the pus-secreting surface, each desquamation after the use of lunar caustic yields a healthier condition, until at length epithelium reappears over the whole of the abraded surface, and the discharge becomes nothing more than the natural lubricating mucus of the part. This cannot, however, as already stated, be carried on satisfactorily unless the discharge from the cervical canal is arrested. Unless this is the case, as soon as the lunar caustic is omitted, the discharge abrades the os again and again, and the mischief remains as before. I have seen cases in which the whole of the lower part of the cervix uteri has been destroyed by cauterization; but, nevertheless, the remains of the glandular apparatus secreted profusely, and the stump of the cervix has been abraded. There are some cases of abrasion in which the nitrate of silver causes great irritation and mischief. This happens in particular in cases of eruption upon the os uteri, and the vascular

condition of the os. Here the discharge and the condition of the surface are often aggravated by the nitrate of silver, or any other irritant, but are soothed by mild and sedative injections.

Pessaries.—The tendency has of late years been to discard pessaries altogether. It has been taken for granted that inflammation is the great source of uterine disorder, and it has in consequence been held absurd to subject patients suffering from leucorrhœa, to the mechanical irritation which pessaries necessarily induce to a greater or less extent. This appears plausible, and no doubt it applies with force to cases of great uterine irritation, and to pessaries which are objectionable on account of their form or material. But I believe that in practice, notwithstanding, pessaries are highly useful in many cases, and that we possess no means by which we can compensate for their use, in cases which require them. It is certain that in cases of procidentia uteri, when the os and cervix are exposed to the irritation of the external air, cervical leucorrhœa with abrasion of the os uteri are almost invariably present. The same things occur in simple prolapsus, from the irritation of the os uteri by the secretions of the lower part of the vagina. Some of the most troublesome instances of leucorrhœa met with in practice are of this latter kind. The best thing which can be done in such cases is to permanently lift the os and cervix uteri into the natural position, and to defend the lower part of the uterus as much as possible from the utero-vaginal discharges. I have found that when no other means will arrest the leucorrhœal discharge accompanying prolapsus, it often ceases after wearing a soft, well-adapted sponge pessary. In epithelial discharge from the vagina, also, when the surfaces are denuded of epithelium, soft pessaries are frequently useful, however much they may seem to be contraindicated in theory. Any irritation they may occasion is more than compensated for by their keeping the opposite surfaces of the vagina from coming in contact with each other. The vaginal secretions are so acrid in some of these cases, that even the finger smarts after making an examination. In the case referred to at page 94, where the denudation of the vagina was most complete, considerable relief was obtained from wearing an abdominal supporter, combined with an elastic vulcanized India-rubber pessary, which could be procured in no other way. Since the return of this patient to the United States, I have heard from her family physician, Dr. Thomas H. Elliott, of

Alleghany, Pa., who states that, "By means of her supporter, and with the aid of the pessary, she is able to walk some little through the house; the last-named instrument she has worn so constantly that she now deems it indispensable to her comfort, whenever on her feet." The pessary used in this case was one of M. Gariel's vulcanized India-rubber instruments. The pessary which I find most useful in the treatment of leucorrhœa combined with prolapsus, is the simple sponge pessary, consisting of a round or oval piece of sponge, to which a tape or ribbon is attached. This is easy of introduction; it supports the os and cervix without causing any great degree of irritation; it absorbs the discharges; and it defends the walls of the vagina and the os and cervix uteri from coming into contact with each other. If the sponge could be deprived of its tendency to smell, it would, in my opinion, be invaluable in the treatment of disease of the os and cervix attended by prolapsus. The principle of keeping the abraded or ulcerated os and cervix uteri free from the irritation of the vaginal discharges, is almost as important as the defence of external ulcers from the external air. By the sponge dressing, the worst cases of ulceration of the os and cervix uteri may sometimes be cured more readily than by the application of caustics. It acts in part the same way as the charpie dressings of the French, and the dressings of uterine ulcerations and abrasions by lint, as practised with great success by the late Professor Kiwisch, while it has the great advantage that it can be introduced and withdrawn by the patient herself. The sponge pessary should be made of a small soft sponge, in preference to a piece cut from a large sponge. It may be worn all day, or during the hours of walking and exercise, and at night it should be placed in cold water. Many women suffering from the different forms of leucorrhœa and disorder of the os and cervix, particularly when combined with weakness of the vaginal walls and prolapsus, can walk with comfort while wearing the sponge, who are unable to move without pain when the uterus is unsupported. Sometimes, in cases when excessive irritation has been caused by a solution of the nitrate of silver and other astringents, I have had bad cases of abrasion of the os uteri, accompanied by purulent discharge, dressed daily with lint, or with lint and some simple unguent, with the best effects.

Some practitioners recommend the use of sponge pessaries, dipped

in the decoction of tormentilla, or a solution of alum or tannin, but I think the clean sponge, wrung out of cold or tepid water, or smeared with oil, much more useful, as, if an astringent be used, it combines chemically with the animal matter of the sponge, and renders it so hard and inelastic as to irritate the vagina and os uteri almost as much as a wooden pessary. It is only in cases marked by great insensibility of the vagina and os uteri that wooden pessaries can be worn without injury. In leucorrhœa accompanied by prolapsus, no pessary is admissible unless it is soft and elastic, as is the case with those made of sponge and vulcanized India-rubber. Dr. Meigs states that in America small bags, or sacs, filled with coarsely powdered galls, which are termed sachets, are much used; but they are harder and rougher than almost any other form of uterine support, and I have seen great irritation and increase of the discharge caused by their use. I once had a patient come to me with her vagina closely impacted with several of these bags, and suffering the most intense pain from acute vaginitis.

Cubeba and Matico, &c.—Cubeba has long been recommended by Dr. Billing and others in cases of leucorrhœa, and it is a very valuable medicine, particularly in cases of leucorrhœa combined with amenorrhœa and torpor of the uterine and ovarian functions. Given in doses of 3ss to 3j three times a day, it improves the digestive powers, and appears to have a special stimulant and astringent effect upon the glands of the cervix uteri. Many cases of simple mucous leucorrhœa get quite well under the administration of cubeba alone. Another medicine, *Matico*, is similar in its action to cubeba, but its astrin-gency is perhaps more powerful. It is useful in the same kind of cases. In doses of 3j to 3ss two or three times a day, it exerts a marked influence on many cases of leucorrhœa. All the remedies which act on the male urethra, exert an influence upon the canal of the cervix uteri, and in this way turpentine and copaiba are found to act beneficially in leucorrhœal discharges.

Bathing, Change of Air, &c.—A course of sea-bathing is often of the utmost service during the treatment of leucorrhœa, and for establishing the cure of the complaint. I believe that in persons living at the seaside, and who use sea-bathing, leucorrhœal discharges are not common. Cold or tepid local bathing is highly useful, and, when the discharge is excessive, cold or warm hip-bathing in a strong solution of alum (1 lb. to the gallon of water) is very

beneficial. Cold bathing not only affects the lower part of the vagina, with which the water comes in contact, but, by a reflex action, contracts the uterus itself, even in the unimpregnated state. I have no doubt that if cold or tepid hip-bathing were more common and habitual than it is, leucorrhœa would be much less frequent. When astringent solutions are used, it increases the efficacy of the bath to admit the solution of alum, &c., to the os and cervix uteri during the bath. An ingenious instrument, contrived for this purpose by Mr. Walter Bryant, is sold by Coxeter, and I have frequently had recourse to it with very good effect, both in cases of leucorrhœa and prolapsus. Change of air, and residence in a dry situation, is useful in this as in all other disorders depending upon, or accompanied by, debility.

Rest and Recumbency.—In the treatment of all affections of the uterus accompanied by pain, rest is an important item; it is very necessary in cases of leucorrhœa attended by constant and excessive lumbar pain. In cases also where the pain is moderate, but is much increased by walking, and where exercise increases the leucorrhœal discharge and causes it to be tinged with blood, everything like fatigue should be avoided. In the relaxed condition of the uterus and vagina which accompanies leucorrhœa, standing and walking to any great extent are very likely to bring on prolapsus and procidentia, and it is in this way that many of the worst cases of descent of the womb are caused among the poor. The same conditions are frequently caused among the rich by dancing, or riding on horse-back. Many cases of profuse leucorrhœa will get well from resting for a few weeks, without any other treatment. Dr. West has well observed, that much of the benefit attributed to the treatment of leucorrhœa by caustics may really be attributed to the rest which is enjoined during their application; and Dr. Ashwell lays great stress upon it as a means of cure. This method of relief must not, however, be depended on alone, as leucorrhœal discharge cured in this way is very apt to recur as soon as walking exercise is resumed. As an adjuvant to other measures, moderate restraint as regards exercise is very valuable, but its extent should depend upon the severity of individual cases. Patients should be in the open air as much as possible short of fatigue, and they should lie down an hour or two in the middle of the day, according to circumstances. There are very few cases met with in private practice, in which carriage

exercise, or riding in a chair, cannot be borne, and with advantage. It is only in the very worst cases that patients should be positively confined to the sofa or couch. It is always a hazardous matter to prescribe absolute rest to such patients. Nothing develops the hysterical temperament so certainly as the entire deprivation of exercise. I have known patients kept lying down for two or three years, though suffering only from non-malignant disorder of the os and cervix uteri. It has happened to me to see several such cases where patients, made to lie down for the relief of leucorrhœa and its attendant evils, have become the prey of intense hysteria, and have remained in bed for many years, having gradually acquired the belief that they were unable to rise, though no adequate reason existed for such belief. These cases make the very worst forms of the so-called spinal disorder that are met with in connection with uterine affections. Such patients remain the prey of numerous maladies, partly real and partly imaginary, and are quite unable to move until roused by domestic circumstances, or by some method of treatment strongly appealing to the imagination. But when these victims of the hysterical temperament rise from their long inactivity, they are generally broken in health, both of body and mind. The careful practitioner will have little trouble in distinguishing between cases of this kind and of real inability to move, caused by debility or some adequate physical cause.

Treatment of Vaginal Leucorrhœa.—The constitutional treatment of vaginal leucorrhœa varies little from the treatment of leucorrhœa of the cervix, but the same topical applications cannot always be used in the two forms of disorder. Almost all the astringent substances used for injections in cervical leucorrhœa have an acid reaction, and when the vaginal discharge is not purulent and alkaline, but is, on the contrary, very distinctly acid, injections of acid astringent solutions are irritating and injurious. In simple epithelial leucorrhœa of the vagina, when the lining membrane is intensely red, and the epithelium is thrown off in large quantities, either mixed up in plasma, or in the form of shreds and flakes, much benefit is derived from the use of weak alkaline injections, composed of the bicarbonate of soda or potash in barley water, linseed tea, or poppy infusion. If an astringent be used, I have found the solution of the diacetate of lead to be the best. When the surface of the vagina is in the granular condition and secretes pus copi-

ously, strong astringent injections of tannin and alum, or alum iron, or sulphate of iron, are sometimes very useful. It must, however, be confessed that long-standing cases of vaginal leucorrhœa are less easily made amenable to treatment than leucorrhœa of the os and cervix uteri. It is almost always an expression of constitutional disorder. It resembles skin disease more nearly than the cervical affection; and in cases of eruptions of the vagina, when other means have failed, I have seen the best effects follow the administration of the liquor potassæ arsenitis, or alterative doses of the bichloride of mercury. The remarks upon the use of pessaries apply almost as much to vaginal leucorrhœa as the cervical discharge. It is often of great importance to keep the opposite sides of the vagina from contact, by a sponge or by lint. In many cases of prolapsus uteri with cervical leucorrhœa, there is vaginal disorder, and when this is the case, the vaginal leucorrhœa is generally the primary disorder and the cause of the prolapsus and cervical discharge. The vagina cannot remain long in a state of chronic irritation without such weakening of its contractile walls as to lead to the descent of the uterus; and when prolapsus is present, the uterus and the vagina become sources of mutual irritation. In such cases the sponge pessary is often highly serviceable.

The Sexual Function.—In the treatment of cervical and vaginal leucorrhœa in the married, there is one point which must be noticed, namely, the continuance or absence of sexual intercourse. Absolute separation should never be advised except for good and sufficient reasons. In leucorrhœa intercourse should only be forbidden in the worst cases. This is one objection to the use of caustics in mild cases of leucorrhœa, because it is necessary to enjoin separation while they are employed. When intercourse causes considerable pain, excites bleeding, or where the os and cervix are secreting pus, it is out of the question, but its moderate use is quite compatible with the successful treatment of profuse mucous leucorrhœa. It may be questioned whether it does not relieve the uterus of states of congestion, which occur in the unmarried, and are probably a cause of leucorrhœa in single women, or in the married who live in separation from their husbands. In vaginal leucorrhœa, attended by epithelial abrasion, intercourse is almost always painful and injurious, and it is often attended by such a state of spasm of the ostium vaginae as to render introition impossible.

Examination of the Uterus and Vagina.—It may not be out of place in conclusion to say a few words upon the physical examination of patients suffering from leucorrhœa. There can be no doubt that uterine examinations are resorted to very freely by some practitioners, and that by others they are comparatively neglected. The object to be attained at the present time in this department of practice, is the settlement of this important question, and the establishment of the necessity and propriety of examinations in all cases of real necessity, and of their omission whenever such necessity is not pressing and obvious. There is a moral element in this matter which renders unnecessary examinations a violation of natural delicacy, which should, if possible, be avoided. The moral element is more striking in the case of the unmarried than those females who have married and have borne children. On the other hand, there is a pathological element in the question, and we should hardly be justified in allowing any patient to incur the risk of suffering seriously in health, from excessive scrupulousness about making a vaginal examination. Before the general use of the speculum, patients must constantly have suffered from the absence of this kind of exploration. In recent years every one engaged in the obstetric department of practice must have met with some cases in which examinations with the speculum have been carried to an injurious and an unwarrantable extent, and with others in which patients have suffered materially in health from the neglect or avoidance of the means of physical examination.

The rule I adopt with respect to examinations is as follows. In all married persons suffering from uterine disease, where the symptoms are severe, I make a careful examination digitally and with the speculum, if necessary, at the first time I am consulted. The frequency of subsequent examinations depends upon the nature of the case. With respect to unmarried women, I never make a physical examination unless ordinary means fail of curing the uterine disorder. I then examine in the first instance digitally, and only use the speculum in cases where the finger detects disease of the os or cervix uteri,—such as loss of surface, enlargement of the labia uteri, induration, or gaping of the os uteri, with purulent or muco-purulent discharge. In cases where the hymen remains unbroken, a small tubular speculum should always be used. When there has been long-continued leucorrhœa, the membrane forming the hymen

is so much relaxed that a small tubular speculum, or the speculum used for examining the rectum, can generally be introduced without rupturing the hymen.

Examination with the Speculum.—For ordinary examinations the bivalve speculum is the most convenient we can use. It should not for ordinary cases be more than five inches in length, as a longer speculum tends to push the os uteri from its natural position. By the expansion of the valves both lips of the os uteri can be brought perfectly into view ; and if the os is patulous, the lips can be separated by the action of the dilating valves upon the upper part of the vagina, so as to expose the mucous membrane of the lower portion of the cervical canal. All mucus or discharge should be carefully wiped away, by the speculum forceps and a little lint or cotton wool, so that the state of the mucous membrane beneath may be distinctly observed. The chief disadvantage of the bivalve speculum occurs in cases of great relaxation of the vagina and partial prolapsus, in which the walls of the vagina fall in between the valves, so as almost to occupy the whole field of the speculum. In such cases, the more widely the speculum is expanded, the more the view of the os uteri is impeded, by the falling in of the vagina. Here the tubular speculum is much to be preferred, as entirely getting rid of the difficulty offered by the relaxed vagina. It is also quite as useful as the bivalve instrument when the os uteri is not open, except in cases of anteversion, where though the anterior lip is seen perfectly, it is sometimes difficult to get a good view of the posterior lip. Neither the bivalve nor the tubular instrument should be used without the obturator. In all cases, when a first examination is made, the speculum should be slowly withdrawn, so as to allow of the careful examination of the vagina and the ostium vaginæ. In this way, ulcerative spots in the vagina and vascular tumors of the meatus urinarius, will not escape observation.

As regards the position of the patient best adapted for uterine examinations, the most convenient, especially for digital examination, is for the patient to lie on her left side, with her knees drawn up towards the abdomen. If there should be any retroversion of the uterus, and the os uteri should be thrown forward towards the pubis, this or the kneeling posture is the only position in which the os and cervix uteri can be conveniently examined with the speculum. If, on the other hand, there should be any anteversion of the body

of the uterus, with the os uteri pressing backwards upon the rectum, or if the vagina should be unusually long, the os uteri is more easily examined while the patient lies on her back.

By *digital* examination, we ascertain the presence or absence of tumors in the pelvis; the various forms of descent or version of the uterus; relaxation, or constriction of the vagina; tenderness of any particular part of the vagina or of the os or cervix uteri; increase in volume in the uterus, or any variation from the natural shape, volume, or density of the os uteri; warts or small polypi upon the os uteri, or polypi descending from the fissure of the os uteri; fulness or emptiness of the rectum, any malposition of the bladder, or abnormal state of the urethra.

By examination with the *speculum* we confirm many of the points of information acquired by digital examination; we learn the precise condition of the mucous membrane of the os and cervix as regards vascularity and loss of surface; the nature and extent of the discharge issuing from the os and cervix; the condition of the vagina as regards vascularity, granular condition, and the state of the epithelial coat; the presence of eruptions upon the os uteri and the vagina; the existence of ovula Nabothi; the presence of small bleeding vascular polypi, which may be upon, or just within the os uteri, and which the finger may fail to detect; and the presence of vascular tumors of the meatus. The meaning of the different kinds of discharge met with in such examinations, and the mode of examining these discharges microscopically, have been detailed in previous chapters.

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